

**<sup>(12)</sup> UK Patent Application <sup>(19)</sup> GB <sup>(11)</sup> 2 298 627 <sup>(13)</sup> A**

**(43) Date of A Publication 11.09.1996**

GB 2 298 627 A

Fig .1

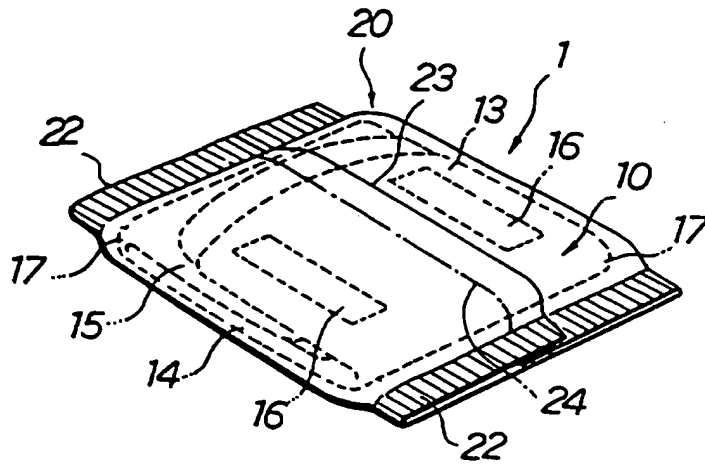


Fig .2

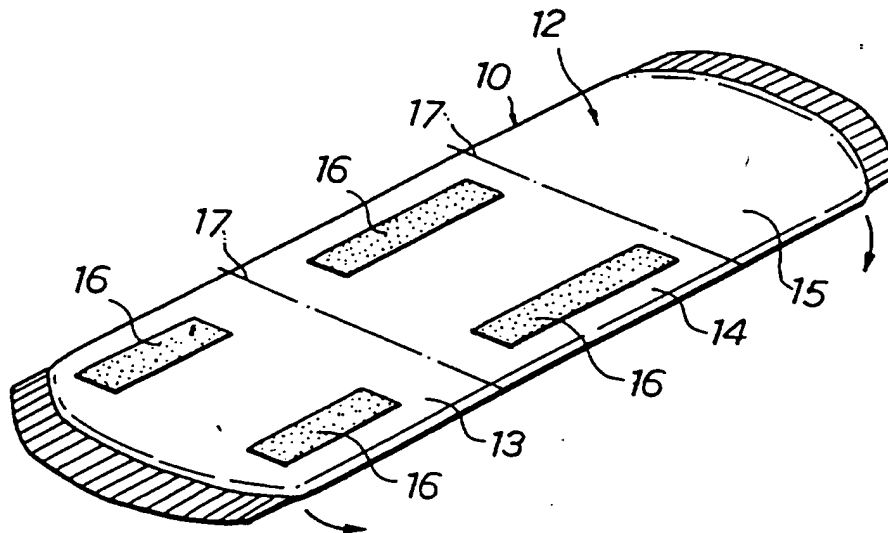


Fig .3

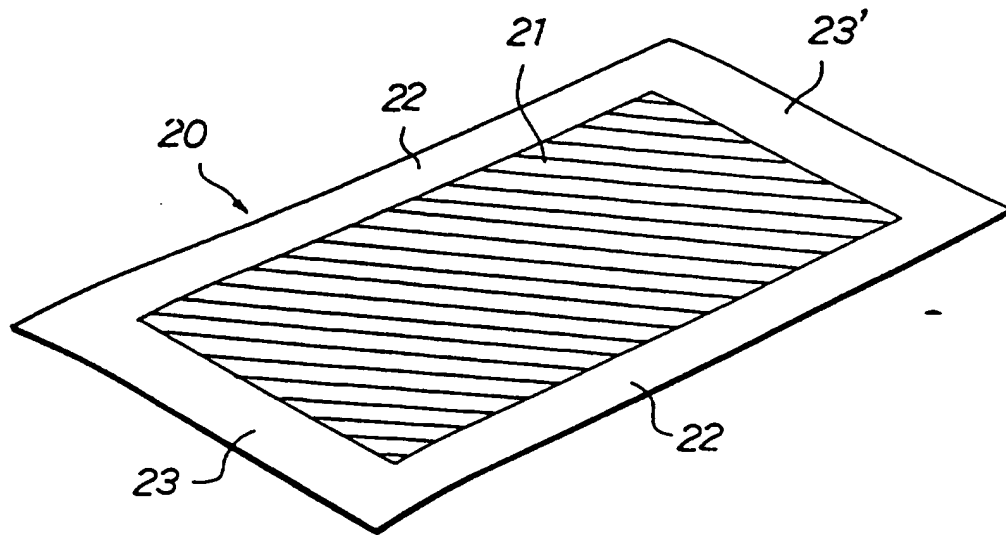


Fig .4

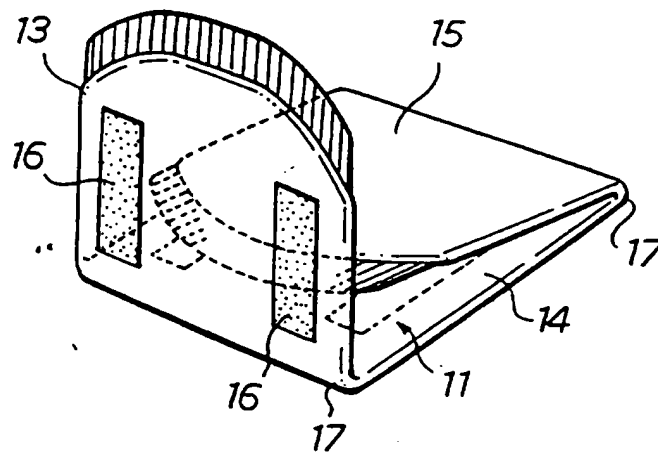


Fig .5

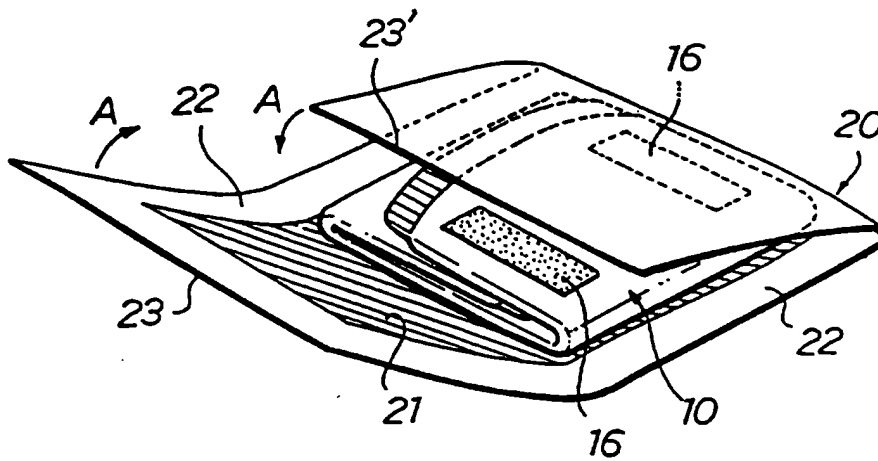


Fig .6

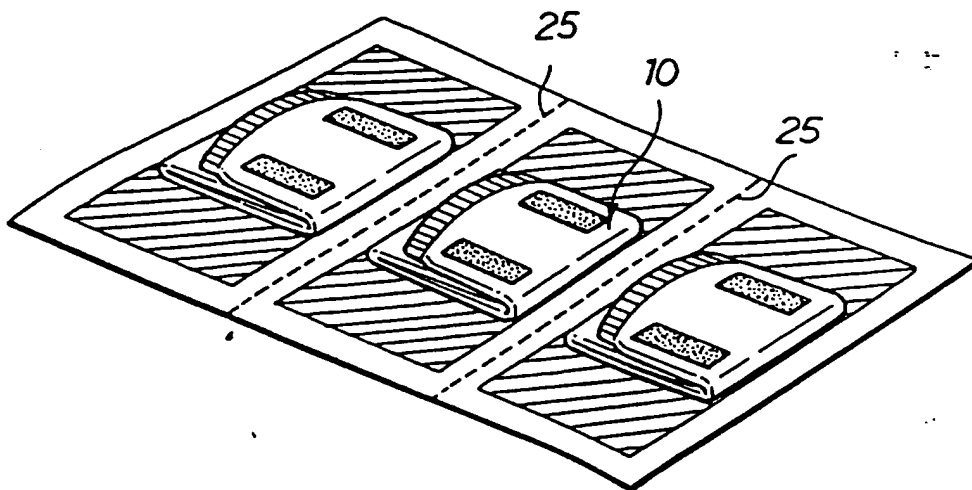


Fig .7

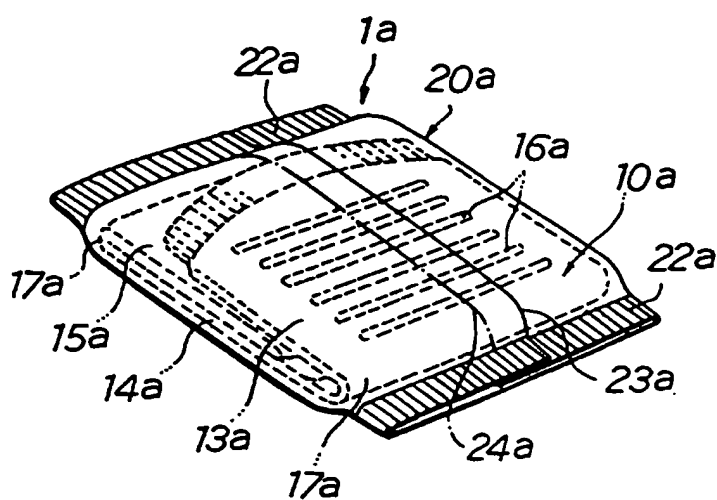


Fig .8

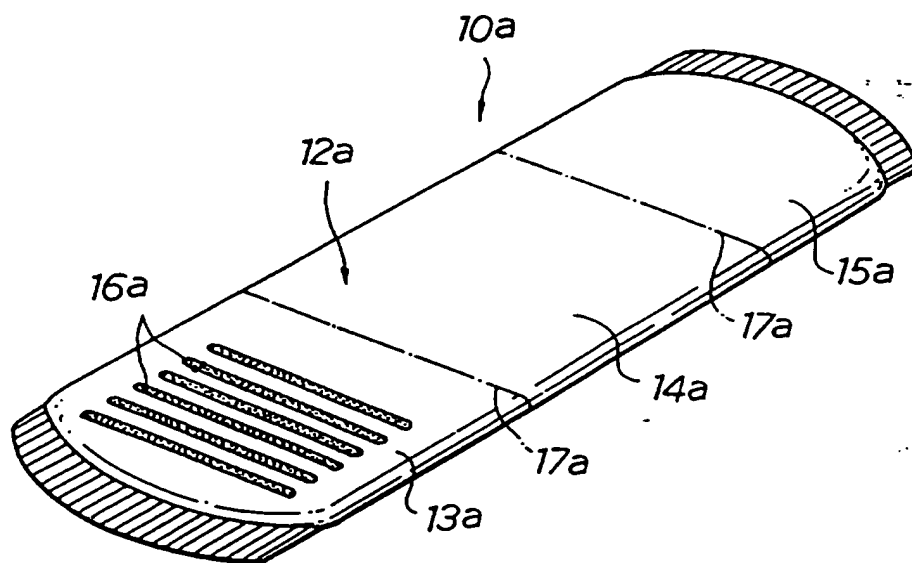


Fig .9

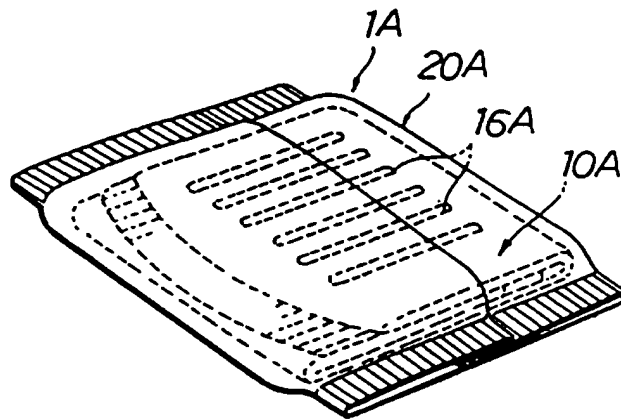


Fig .10

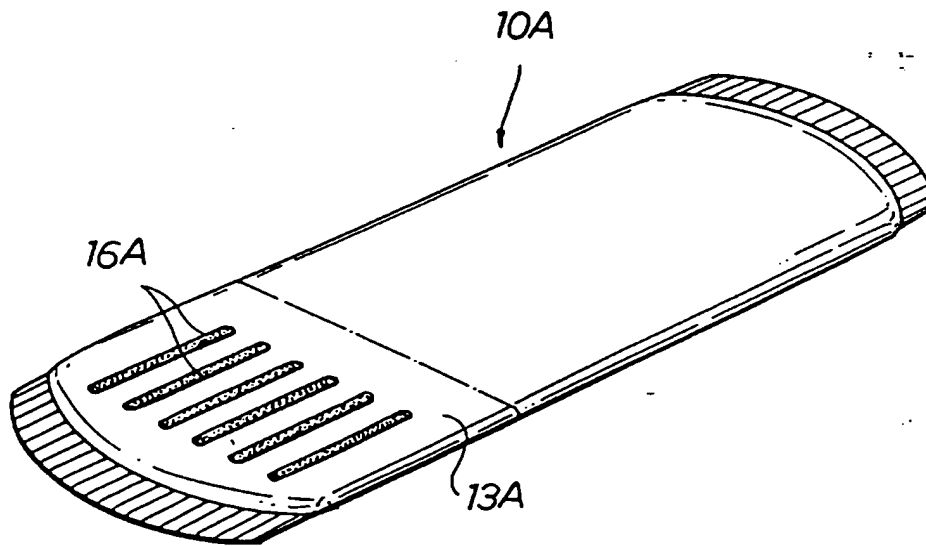


Fig .11

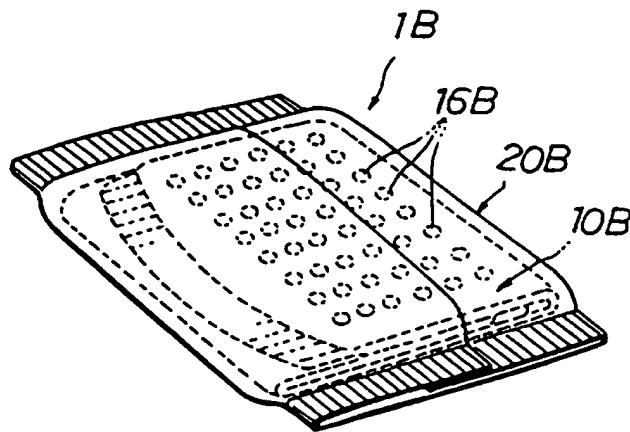


Fig .12

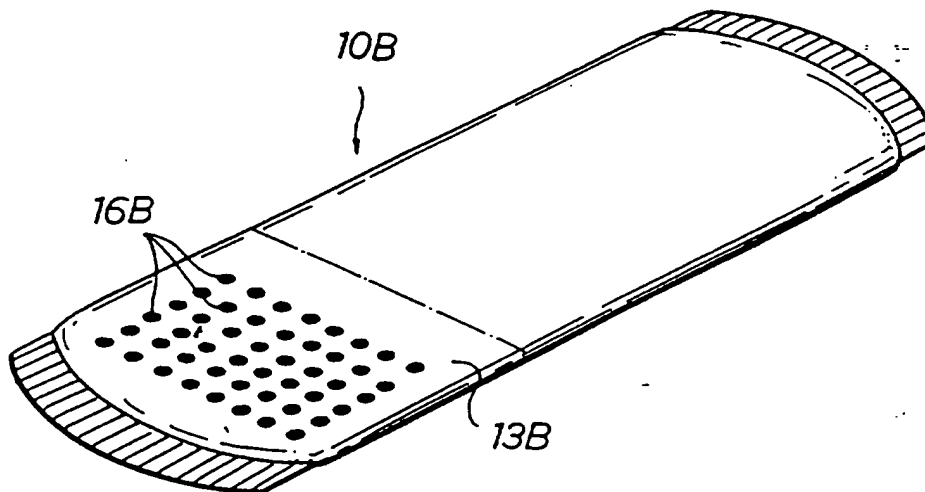


Fig .13

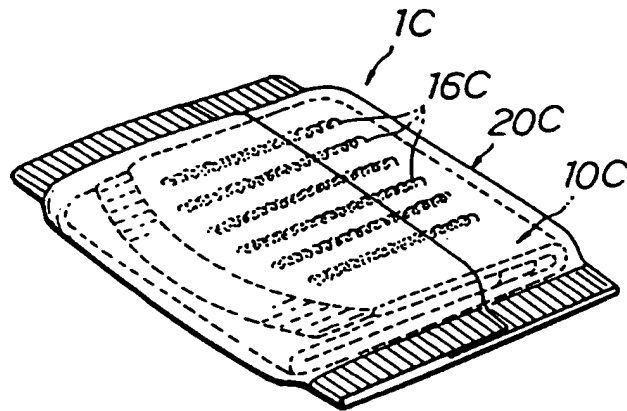


Fig .14

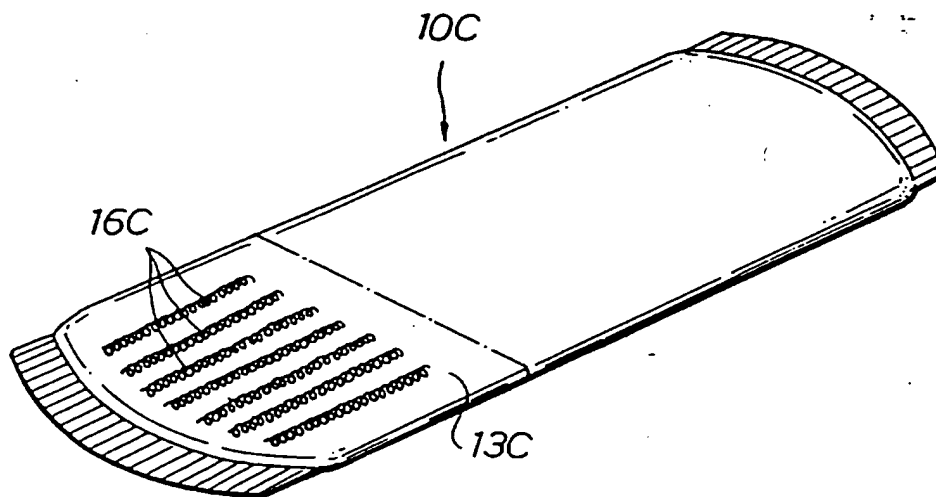




Fig .15

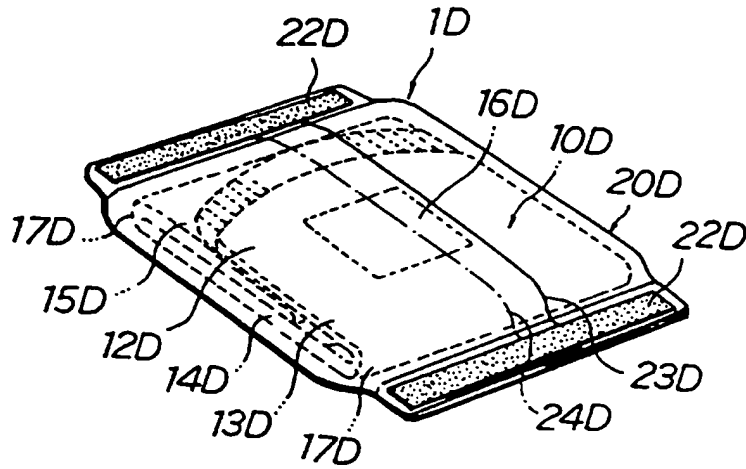


Fig .16

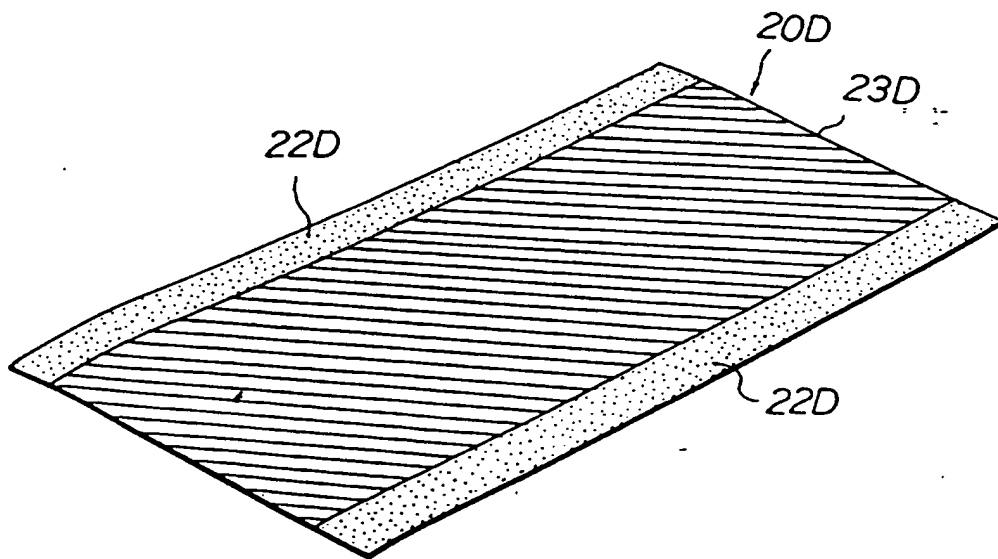


Fig .17

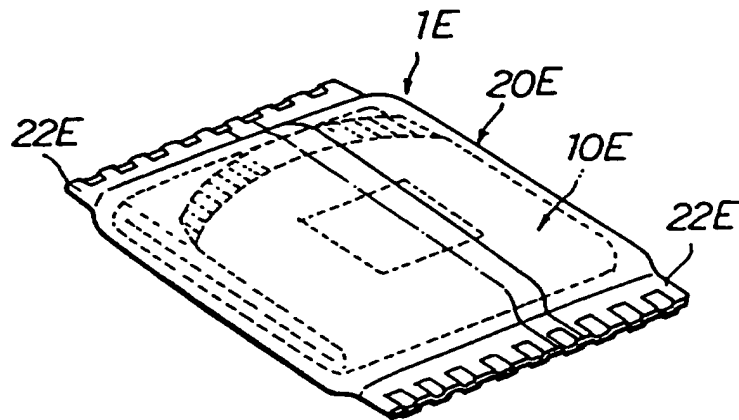


Fig .18

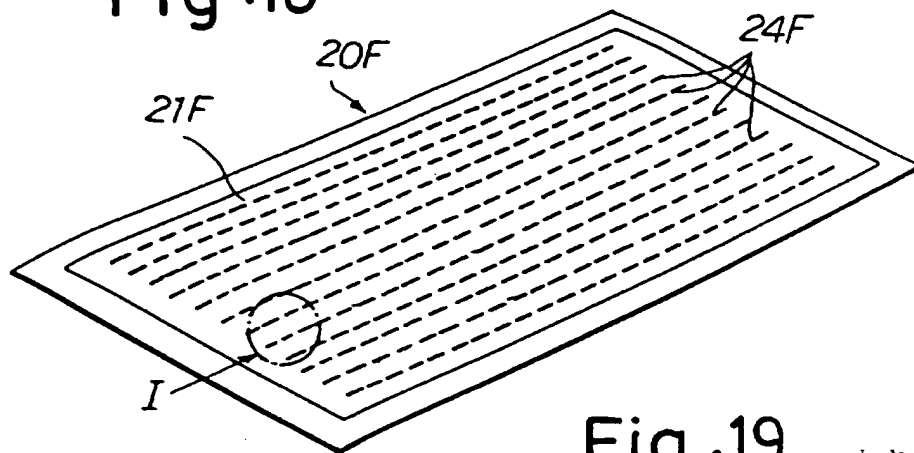


Fig .19

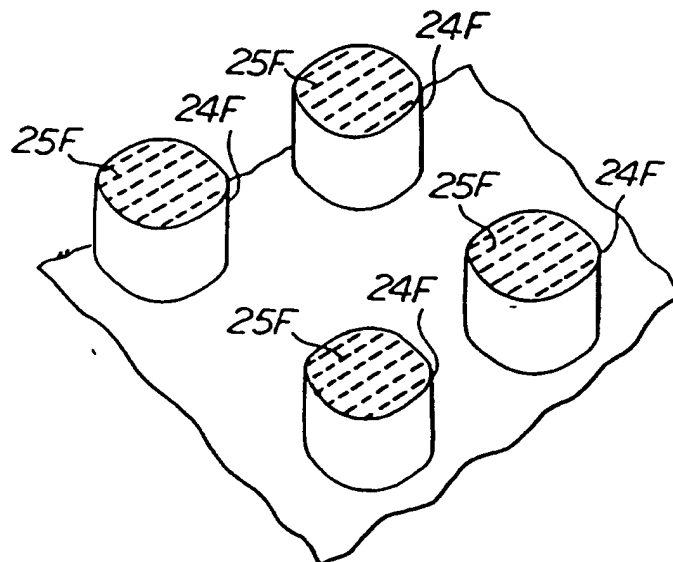


Fig .20

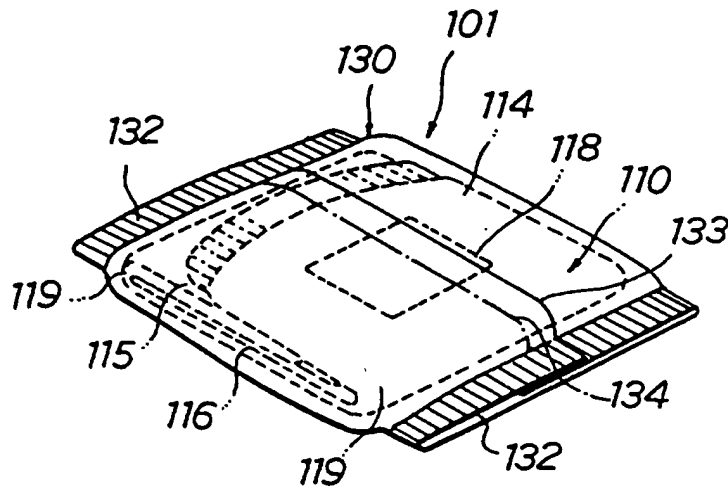


Fig .21

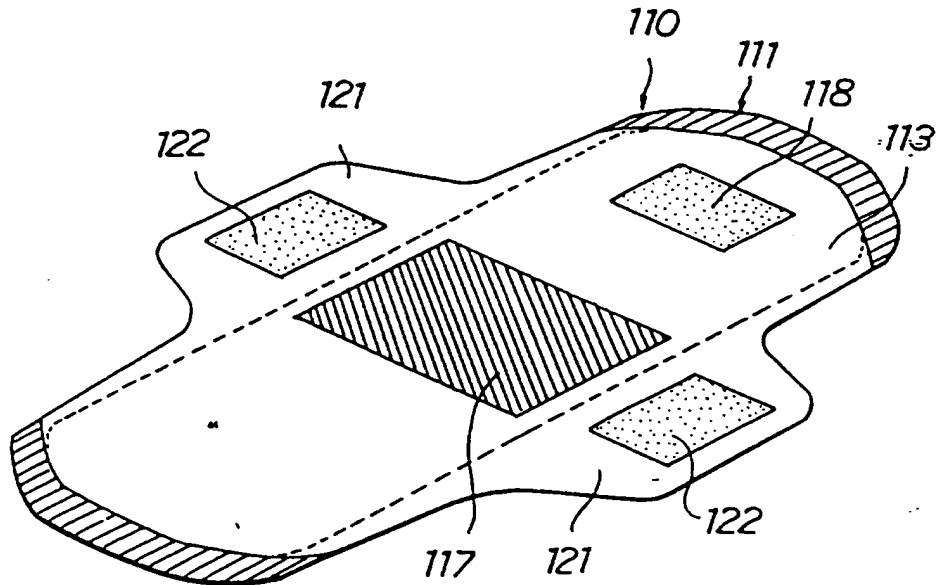


Fig .22

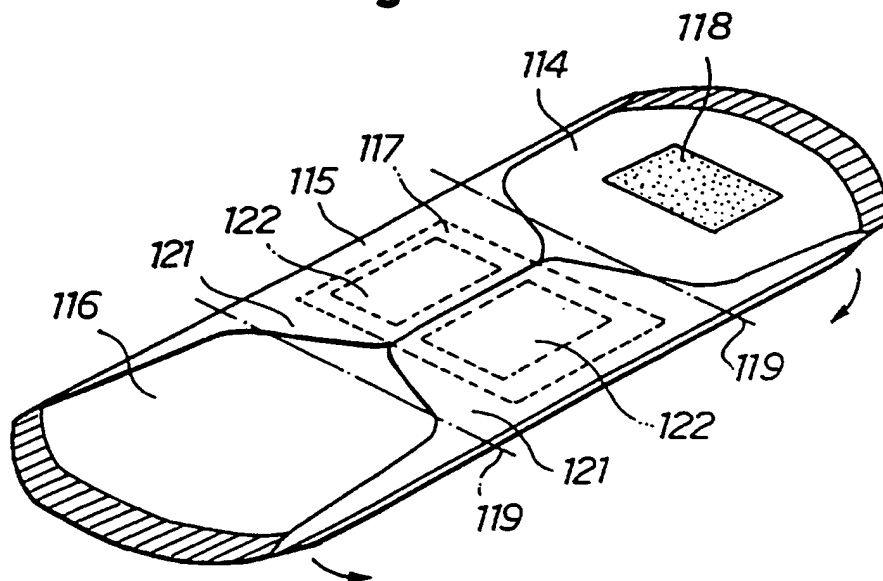


Fig .23

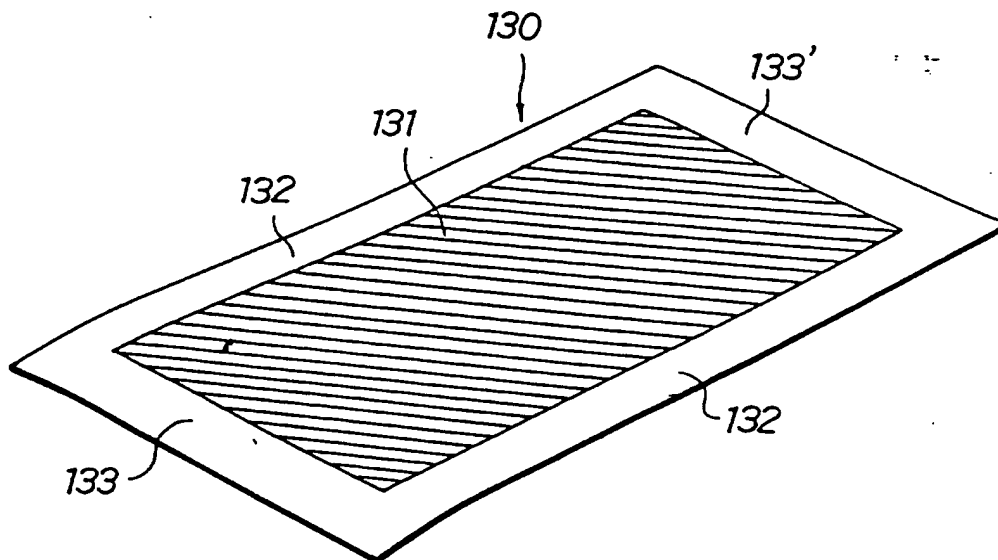


Fig .24

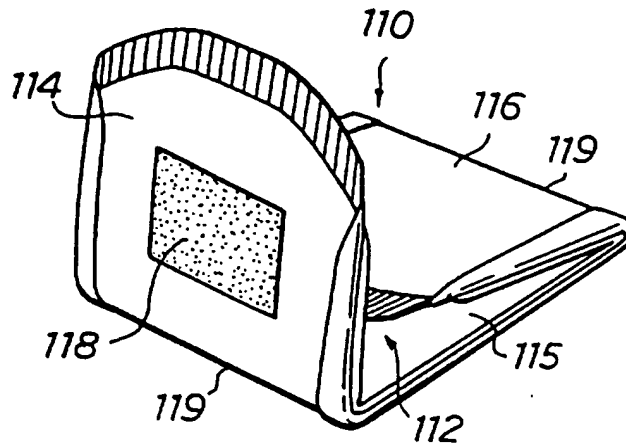


Fig .25

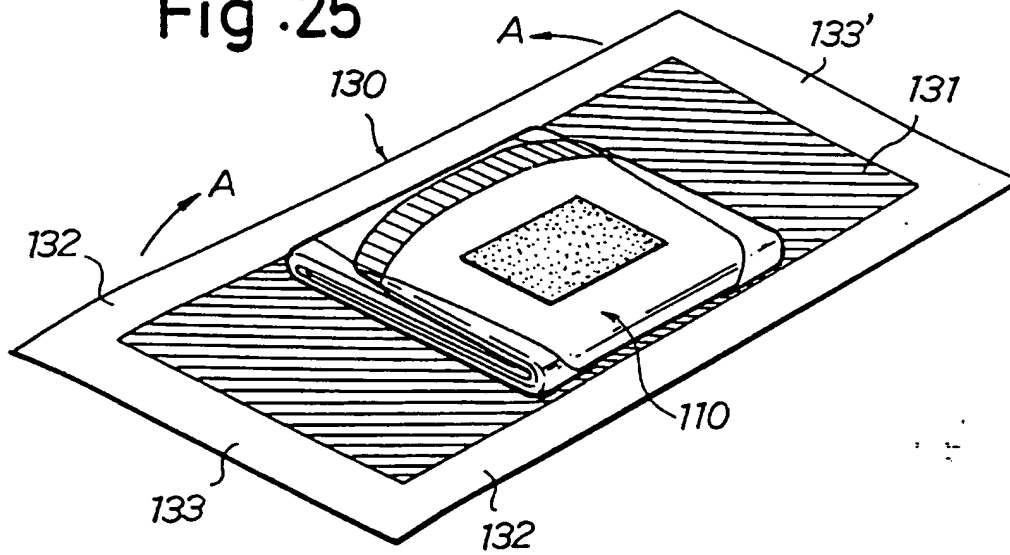


Fig .26

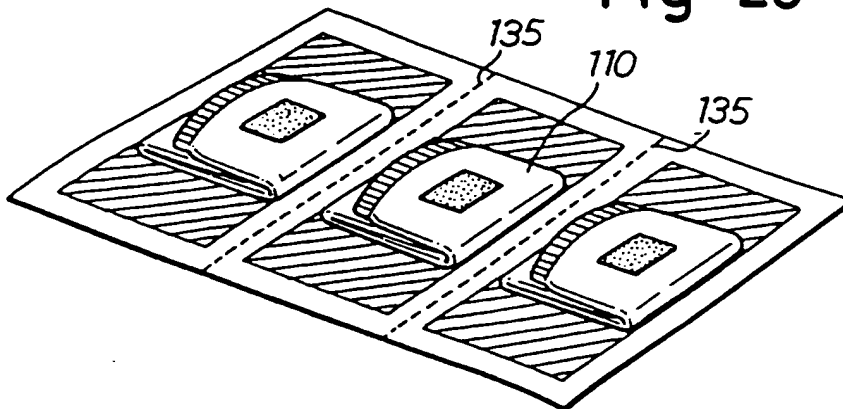


Fig .27A

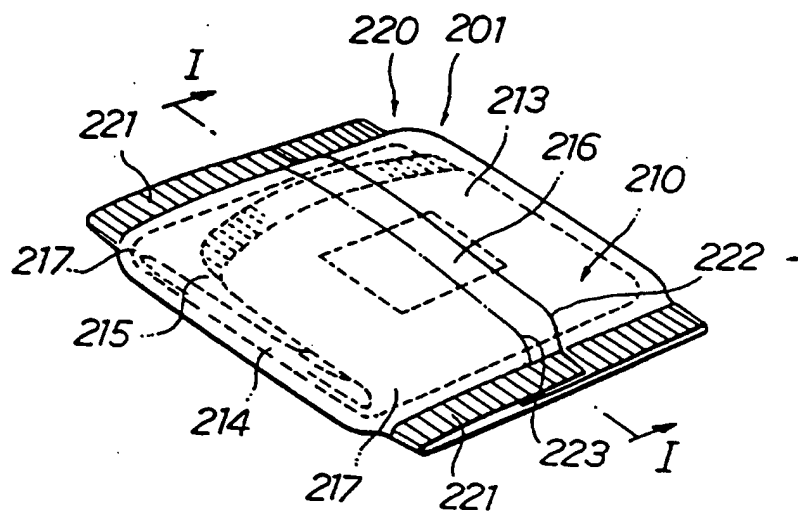


Fig .27B

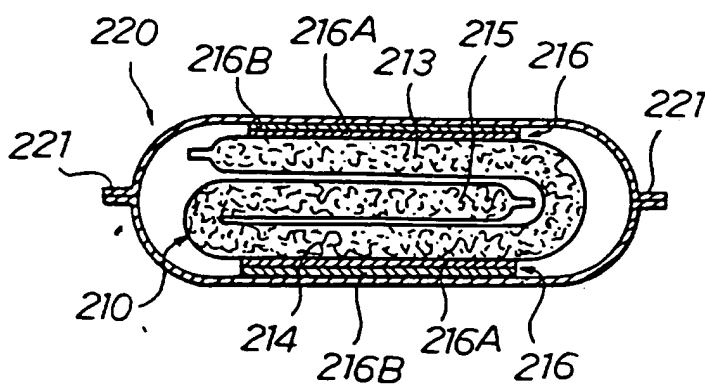


Fig .28

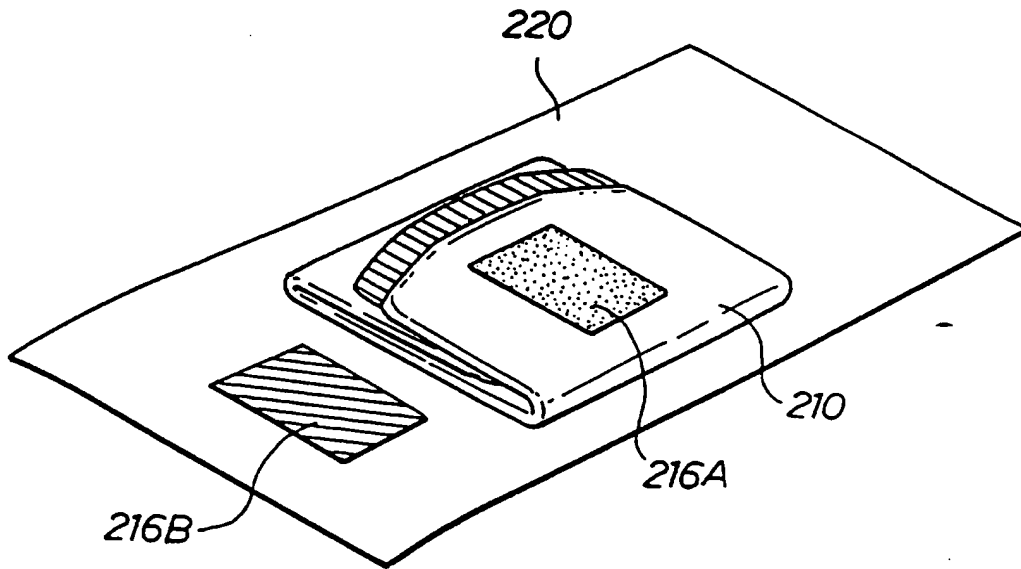


Fig .29

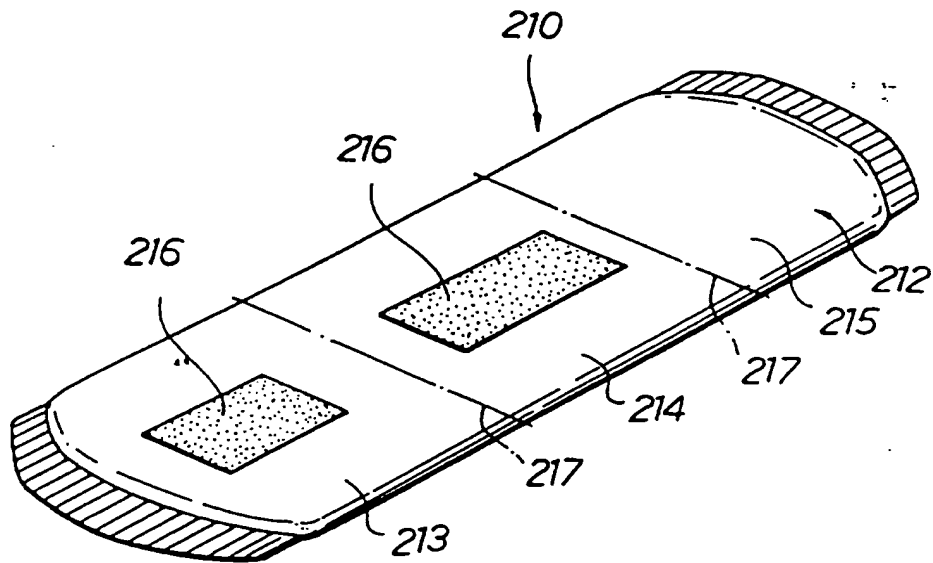


Fig .30

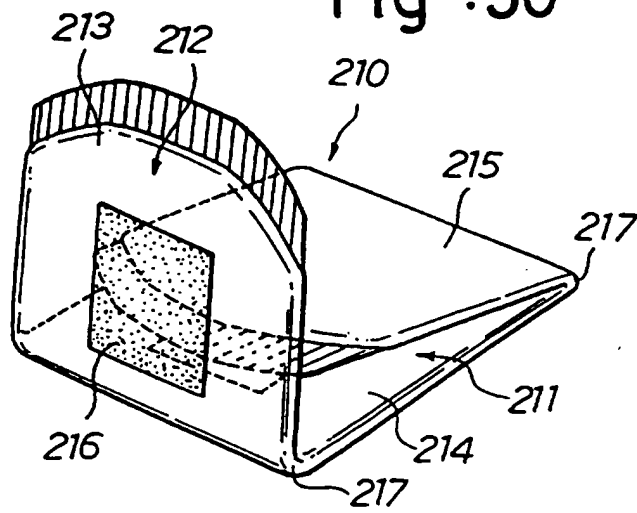


Fig .31

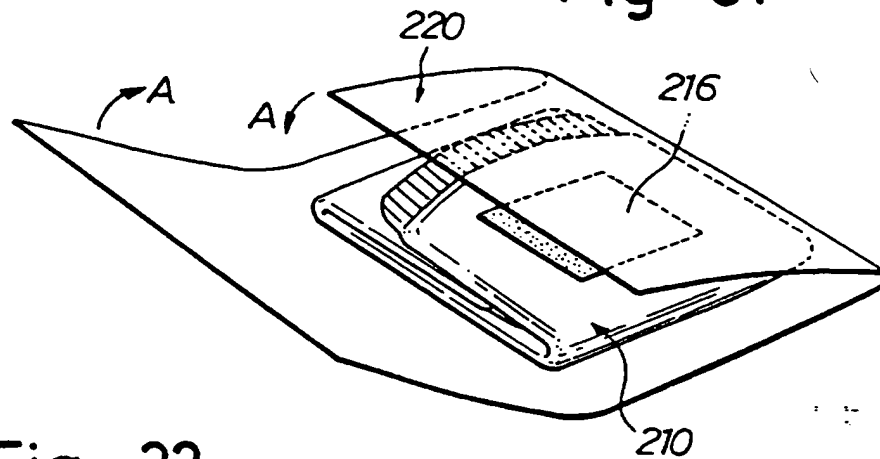


Fig .32

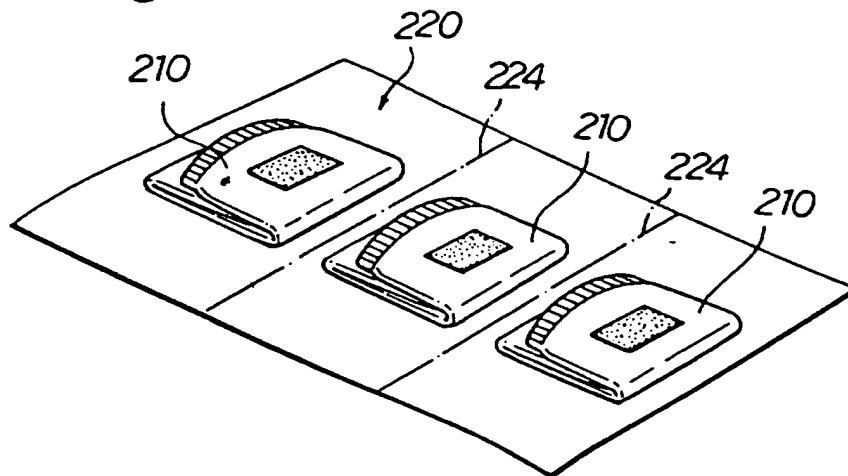




Fig .33A

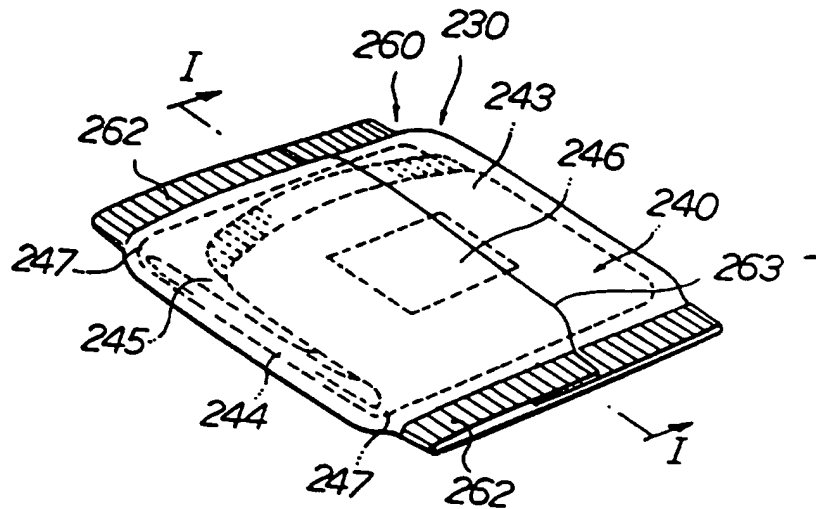


Fig .33B

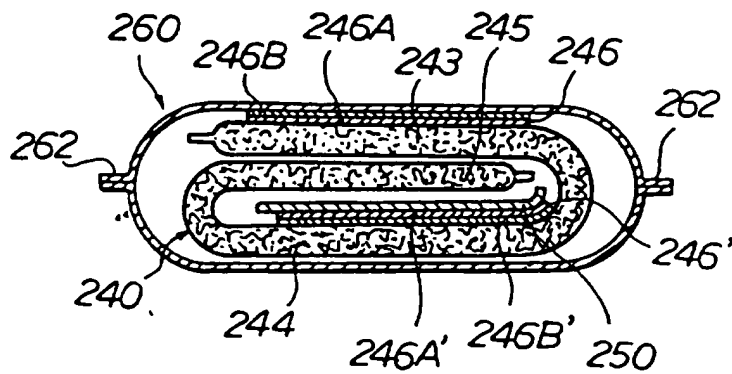


Fig .34A

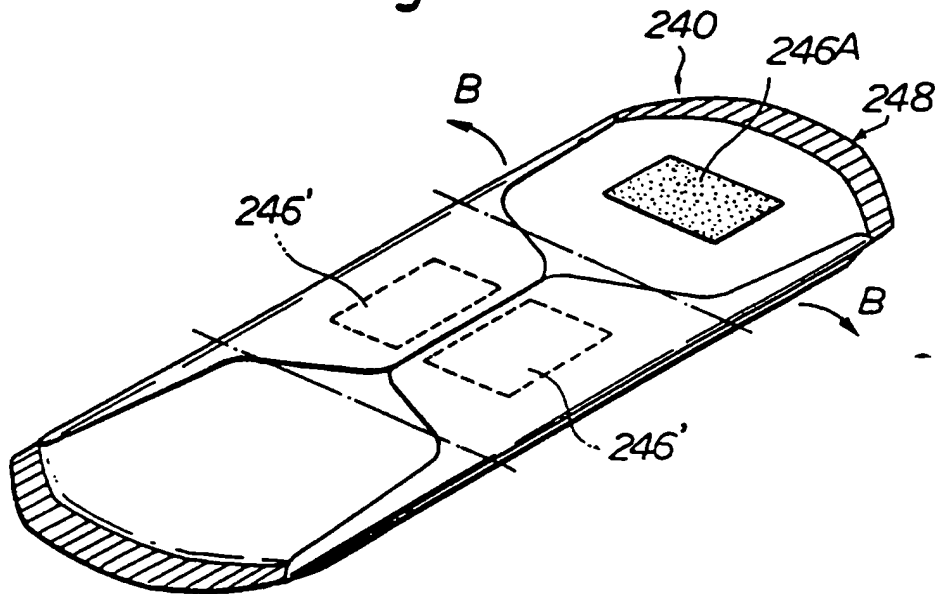
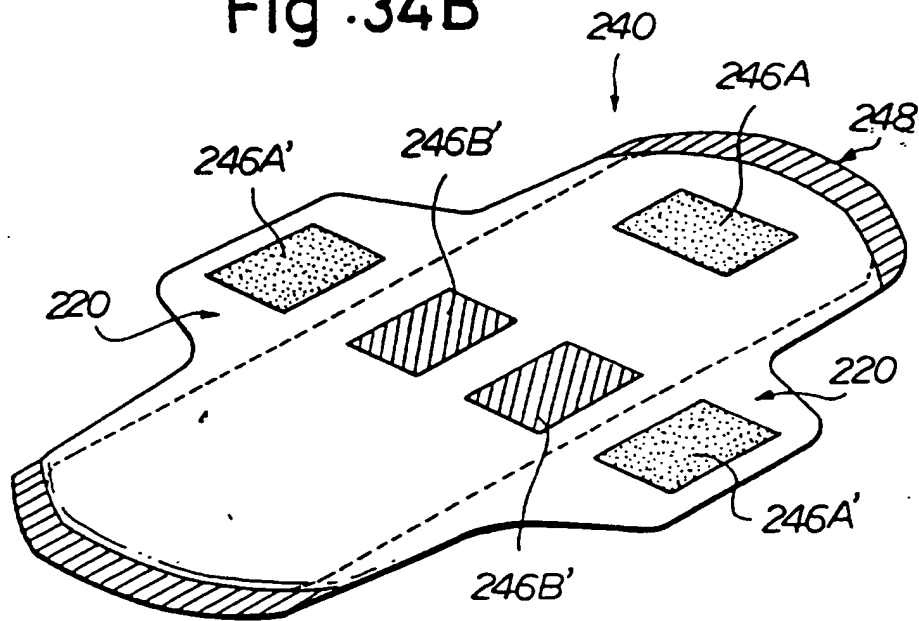


Fig .34B



**2298627**

**WRAPPING STRUCTURE FOR SANITARY NAPKIN**

**BACKGROUND OF THE INVENTION**

**[FIELD OF THE INVENTION]**

This invention relates to a wrapping structure for a sanitary napkin which is not provided with a peelable protective sheet for an adhesive layer adapted to fix the sanitary napkin to shorts but nevertheless has a sufficient degree of capability for assuredly fixing the napkin to the shorts.

**[DESCRIPTION OF THE PRIOR ART]**

The sanitary napkin is usually provided with adhesive agent for fixing the napkin to the shorts in order to prevent positional displacement of the napkin during use, and a peelable protective sheet for the adhesive agent. For using a sanitary napkin of the type just described, it is necessary to peel off the peelable sheet and discard it. It is not only troublesome for the user to peel off the peelable sheet every time the napkin is used but also annoying when the handling of the peelable sheet after it has been peeled off comes out. For example, if the peelable sheet is thrown into a toilet stool, there will be a possibility that the toilet stool is choked.

Many proposals have been made with respect to a wrapping structure for a sanitary napkin having no

peelable sheet. Several concrete examples are as follows:

(1) A wrapping structure for a sanitary napkin in which an adhesive layer of the sanitary napkin is directly in contact with polyolefine film (Japanese Utility Model Publication No. Sho 59-9615).

(2) A wrapping member in which a sanitary napkin is separately wrapped with wrapping material made of water soluble film and having a peelable layer at portion which contacts an adhesive layer of the sanitary napkin (Japanese Laid-Open Utility Model Application No. Sho 59-25371).

(3) A wrapping member in which its wrapping material has a pocket portion, and a sanitary napkin is received in this pocket portion such that an adhesive layer of the sanitary napkin exposes from an open end of the pocket portion, the exposed adhesive layer and a non-adhesive portion of the wrapping material being attached to each other (Japanese Laid-Open Utility Model Application No. Sho 57-34211).

(4) An individual wrapping material for a sanitary napkin, in which a wrapping material having a peel treatment portion at that area which contacts an adhesive portion of the sanitary napkin comprises two sheets sealed at four sides thereof and provided with

perforations for easy opening (Japanese Laid-Open Utility Model Application No. Sho 58-179120).

(5) A wrapping member for a sanitary napkin, having a multilayer resin film as a wrapping material, which includes a mold removing type layer comprising the thermoplastic resin at that area which contacts an adhesive agent layer of the sanitary napkin (Japanese Laid-Open Utility Model Application No. Sho 63-71025).

(6) A wrapping structure for a sanitary napkin which comprises a sheet of film formed by the thermoplastic resin chiefly composed of olefin copolymer and silicon copolymer (Japanese Laid-Open Utility Model Application No. Hei 2-35724).

(7) A wrapping structure for a sanitary napkin including a peeling area coated with silicon and a sealing area to be heat sealed (Japanese Laid-Open Utility Model Application No. Hei 4-11324).

(8)-(1) A wrapping member for a sanitary napkin with a flap, in which the flap is used as a protective member for covering and protecting an adhesive agent of the sanitary napkin (Japanese Laid-Open Utility Model Application No. Hei 3-46316).

(8)-(2) A wrapping member for a sanitary napkin with a flap, in which an adhesive layer of the flap and an adhesive layer of an absorbent body are covered with

a double faced peelable sheet (Japanese Laid-Open Utility Model Application No. Sho 63-186645).

(8)-(3) A napkin, in which adhesive layers are disposed each at a central portion of an absorber and a flap portion of the napkin, and these adhesive layers are protected by a common peelable sheet (Japanese Laid-Open Patent Application No. Hei 2-29249).

(8)-(4) A sanitary napkin with a flap, in which adhesive layers on a central portion of an absorber-and the flap portion of the sanitary napkin are protected by a peelable sheet whose double surfaces are subjected to peel treatment (Japanese Laid-Open Patent Application No. Sho 63-186645).

However, in the above wrapping member, the following problems (1) to (8) and others are encountered.

(1) In the above wrapping member of (1), since the wrapping material for wrapping the napkin is a simple film (i.e., film unit itself), peelability becomes worse with the passage of time with the result that the wrapping material is expanded or even torn when the napkin is taken out. If the thickness of film is increased in order to avoid that, there will be encountered the problems that the cost is increased and the wrapping material becomes difficult to be opened because the film itself becomes hard (i.e., the film

looses its flexibility).

(2) In the above wrapping member of (2), since the film is low in strength, it is expanded or torn when the wrapping material is peeled off. If the film is increased in peelability in order to solve that problem, the solubility of film will be sacrificed with the result that when the wrapping member is thrown into a toilet stool, the toilet stool is choked.

(3) In the above wrapping member of (3), since the adhesive layer can be arranged only at a part of the napkin, the fixability is poor when the napkin is in use.

(4) In the above wrapping member of (4), since the wrapping member is inflated by air easily entered therein through the perforations, the sanitary napkin is inconvenient to carry with and the wrapping member is difficult to be opened.

(5) and (6) In the above wrapping members of (5) and (6), since a substance containing a peelable substance such as silicon resin or the like, or copolymer of the peelable substance is used as the thermoplastic resin, a peeling substance is bled out and the peelability is likely to become unstable depending on temperature and moisture. Further, there is produced an area in the peelable surface where peeling strength

partially become worse and it sometimes happens that the film cannot be peeled off. Also, it often happens that the peeling substance bled out migrates to the adhesive surface, which makes it difficult to maintain the peeling stability, which tends to be lowered with the passage of time, under any circumstances.

Furthermore, since the adhesive agent can be disposed only at a part of the napkin in any of the above wrapping member structures of (1) to (6), the sanitary napkin having such wrapping structure is poor in fixability relative to the shorts when in use.

(7) In the above wrapping member of (7), the same problems as in the above (5) and (6) are encountered. Furthermore, since a sheet of film is used in which a peelable area and sealable area are preset, it is necessary that a heat sealing layer is employed and a product is wrapped always in a predetermined position. Thus, economic efficiency and productivity are poor.

(8) In the above wrapping member of (8)-(1), a provision of a peelable sheet is still required for the adhesive layer of the absorbent body, and therefore the above problems involved in the peelable sheet are not yet solved.

In the above wrapping member of (8)-(2), since both the adhesive layers on the flaps and absorbent



body are covered each with a double faced peelable sheet, the above problems involved in the peelable sheet are not yet solved.

In the above napkin of (8)-(3), the adhesive layers can be disposed on the flap portion and the central area of the central absorber only and cannot be disposed on the forward and rearward areas of the central absorber. Accordingly, the napkin body is readily displaced relative to the shorts when in use.

In the above napkin of (8)-(4), for using the napkin, it is necessary that the adhesive portion of the flap portion is peeled off first and after the flap is secured to a crotch portion, the peelable sheet of the central absorber is peeled off. However, with this arrangement, the sanitary napkin cannot be adhered to a predetermined position and the handling is very complicated.

That is, the structures of the above wrapping members of (1) to (8) cannot satisfy both the peelability of the adhesive layers disposed on the sanitary napkin relative to the peelable layer disposed on the wrapping member, and the tucking strength of the adhesive layers relative to the shorts while maintaining the ability of practical use.

#### SUMMARY OF THE INVENTION

It is ther fore the first object of the present invention to provide a wrapping structure for a sanitary napkin, in which it is not necessary to peel off and discard a peelable sheet when the sanitary napkin is in use and therefore the problems associated with the peeling off and discursion are not encountered, and which has a sufficient amount of fixing strength relative to the shorts.

It is the second object of the present invention to provide a wrapping structure for a sanitary napkin, in which in a sanitary napkin with flaps, adhesive layers can be protected without using any peelable sheet, it is not necessary to peel off and discard a peelable sheet when the sanitary napkin is in use and therefore the problems associated with the peeling off and discursion are not encountered, and which has a sufficient amount of fixing strength relative to the shorts.

It is the third object of the present invention to provide a wrapping structure for a sanitary napkin, in which the sanitary napkin includes an adhesive layer having a sufficient amount of tucking strength relative to the shorts when the sanitary napkin is in use, and the adhesive layer is excellent in peelability.

The present invention has achieved the above-

mentioned first object by providing a wrapping structure for a sanitary napkin in which the sanitary napkin is folded back with those areas of its surface, which do not contact the user's skin, exposed, and individually wrapped with a wrapping material, wherein the exposed non-contacting surface areas of the sanitary napkin folded back are provided each with an adhesive layer; and a peelable layer is provided on that part of an inner area of the surface of the wrapping material which corresponds to the adhesive layers (the expression "the first invention" used hereinafter refers to this invention).

Similarly, the present invention has achieved the above-mentioned second object by providing a wrapping structure for a sanitary napkin, in which the sanitary napkin having a pair of flaps extending widthwise outwardly from opposite longitudinal marginal side portions of a napkin body is folded back with that area of a surface of the napkin body, which does not contact the user's skin, exposed, and individually wrapped with a wrapping material, wherein those areas of surfaces of the pair of flaps, which do not contact the user's skin, are provided each with a first adhesive layer, and the non-contacting surface area of the napkin body is provided with a first peelable layer; the pair of

flaps are bent toward the non-contacting surface area side of the napkin body, and the first adhesive layers and the first peelable layer are detachably adhered to each other; the exposed non-contacting surface area of the sanitary napkin folded back is provided with a second adhesive layer, and that inner area of the surface of the wrapping material, which corresponds to the second adhesive layer, is provided with a second peelable layer; and the second adhesive layer and the second peelable layer are detachably adhered to each other (the expression "the second invention" used hereinafter refers to this invention).

As a result of repeated hard study made by the present inventors in order to solve the above problems, they found out that the above-mentioned third object can be achieved by forming the adhesive layer disposed on the sanitary napkin using an adhesive agent having a particular function.

This invention has been made based on the above-mentioned finding and provides a wrapping structure for a sanitary napkin which comprises a sanitary napkin and a wrapping material for wrapping the sanitary napkin, and in which the sanitary napkin is folded along folding portions, and an adhesive layer is disposed between that exposed area of a surface of the sanitary napkin,

which do not contact the user's skin, and an inner area of a surface of the wrapping material, wherein the adhesive layer comprises an adhesive agent which is separated in layer, when the wrapping structure is opened, to form adhesive portions each in the non-contacting surface area of the sanitary napkin and the inner surface area of the wrapping material, respectively (the expression "the third invention" used hereinafter refers to this invention).

Also, the present invention provided a wrapping structure for a sanitary napkin, in which in the third invention, the sanitary napkin includes a pair of flaps extending widthwise outwardly from opposite longitudinal marginal side portions of a napkin body, the napkin being folded back after the pair of flaps are folded back toward the contacting or non-contacting surface area side of the napkin body.

In the wrapping structure for a sanitary napkin according to the present invention (the first invention), the adhesive layer disposed on the non-contacting surface area of the sanitary napkin is protected by the peelable layer disposed on the inner surface area of the wrapping material. For using the sanitary napkin, the wrap is partly opened and then the wrapping material is simply peeled off the sanitary napkin.

When in use, the sanitary napkin is assuredly firmly secured to the shorts.

In the wrapping structure for a sanitary napkin according to the present invention (the second invention), the first adhesive layer disposed on the non-contacting surface side of the flaps is protected by the first peelable layer disposed on the non-contacting surface side of the napkin body, and the second adhesive layer disposed on the non-contacting surface side of the sanitary napkin is protected by the second peelable layer disposed on an inner surface area of the wrapping material. For using the sanitary napkin, the wrap is partly opened, the wrapping material is peeled off the sanitary napkin and the flaps are simply peeled off the napkin body. When in use, the sanitary napkin is assuredly firmly secured to the shorts.

In the wrapping structure according to the present invention (the third invention), the sanitary napkin provided on its non-contacting surface with the adhesive layer is folded back along the folding portion, the adhesive layer is exposed, and the sanitary napkin is individually wrapped with the wrapping material such that the exposed adhesive layer is protected. For opening the wrapping structure, the adhesive layer is separated in layer, and adhesive portions are formed

respectively on the non-contacting surface area of the sanitary napkin and the inner surface area of the wrapping material. Accordingly, even if there is no provision of the peelable layer, the wrapping structure will have sufficient amount of tucking strength when in use.

According to the present invention (the first invention), the time and labor for peeling off the peelable sheet at the time the sanitary napkin is used can be eliminated, and since it is not necessary to discard the peelable sheet, the toilet stool will not be choked with the peelable sheet thrown therein. Moreover, for using the sanitary napkin, the sanitary napkin has sufficient amount of firmly securing strength relative to the shorts.

According to the present invention (the second invention), in the sanitary napkin with the flaps, the adhesive layer can be protected without using any peelable sheet, and since there is no need to peel off and discard the peelable sheet when the sanitary napkin is used, the problems associated with the peeling off and discursion are not encountered. Moreover, the wrapping structure of this invention has sufficient amount of fixing strength relative to the shorts.

According to the present invention (the third

invention), there is provided a wrapping structure for a sanitary napkin, in which the sanitary napkin includes the adhesive layer having sufficient amount of tucking strength relative to the shorts when the sanitary napkin is in use, and the adhesive layer is excellent in peelability. Concretely, the following effects (1) to (8) and others are exhibited.

(1) The wrapping material is not expanded and/or torn.

(2) The sound produced at the time the wrap is peeled off is small.

(3) The wrapping material is not contracted by heating.

(4) The wrapping material can easily be peeled off the adhesive layer.

(5) In the sanitary napkin with the flap, particularly, a number of adhesive portions can be provided.

(6) The time and labor for peeling off the peelable sheet at the time the sanitary napkin is used can be eliminated. Moreover, since it is not necessary to discard the peelable sheet, the toilet stool is not choked with the peelable sheet thrown therein.

(7) The adhesive layer on the sanitary napkin may be spread to the extent able to have sufficient amount of fixing strength relative to the shorts.



(8) Since the wrapping material is not required to be subjected to peel treatment and the adhesive layer is also formed on the wrapping material, the wrapping material can be attached to the underwear when in use.

5 Further preferable aspects of the invention are found in the following clauses:

10 1. A wrapping structure for a sanitary napkin in which the sanitary napkin is folded back with those areas of its surface, which do not contact the user's skin, exposed, and individually wrapped with a wrapping material,

15 wherein said exposed non-contacting surface areas of said sanitary napkin folded back are provided each with an adhesive layer; and

a peelable layer is provided on that part of an inner area of the surface of said wrapping material which corresponds to said adhesive layers.

20 2. A wrapping structure for a sanitary napkin as in clause 1, in which said sanitary napkin is folded back at two folding portions for dividing a longitudinal direction of said sanitary napkin into three generally equal portions, namely, a forward portion, a central portion and a rearward portion, such that said non-contacting surface areas in said forward and central portions are exposed.

30 3. A wrapping structure for a sanitary napkin as in clause 1, in which each of said non-contacting surface areas provided with said adhesive layer includes an adhesive area and a non-adhesive area.

4. A wrapping structure for a sanitary napkin as in

clause 1, in which said peelable layer comprises a peelable tape jointed to said wrapping material.

5        5.    A wrapping structure for a sanitary napkin as in clause 1, in which 180° peel strength of said adhesive layers relative to said peelable layer is 30 to 90 g/50mm, and

          tucking strength of said adhesive layers is 250 g/25mm or more.

10

6.    A wrapping structure for a sanitary napkin as in clause 1, in which said adhesive layers are laid in an opening direction of said wrapping structure.

15

7.    A wrapping structure for a sanitary napkin as in clause 1, in which said wrapping material comprises a peelable sheet whose entire inner surface area is provided with a peelable layer, and at least one side thereof is sealed.

20

8.    A wrapping structure for a sanitary napkin as in clause 1, in which at least that part of said inner surface area of said wrapping material where said peelable layer is provided includes an irregular portion.

25

9.    A wrapping structure for a sanitary napkin, in which said sanitary napkin having a pair of flaps extending widthwise outwardly from opposite longitudinal marginal side portions of a napkin body is folded back with that area of a surface of said napkin body, which does not  
30        contact the user's skin, exposed, and individually wrapped with a wrapping material,

          wherein those areas of surfaces of said pair of flaps, which do not contact the user's skin, are provided

each with a first adhesive layer, and said non-contacting surface area of said napkin body is provided with a first peelable layer;

5        said pair of flaps are bent toward said non-contacting surface area side of said napkin body, and said first adhesive layers and said first peelable layer are detachably adhered to each other;

10        said exposed non-contacting surface area of said sanitary napkin folded back is provided with a second adhesive layer, and that inner area of the surface of said wrapping material, which corresponds to said second adhesive layer, is provided with a second peelable layer; and

15        said second adhesive layer and said second peelable layer are detachably adhered to each other.

20        10. A wrapping structure for a sanitary napkin as in clause 9, in which said sanitary napkin is folded back at two folding portions for dividing a longitudinal direction of said napkin body into three generally equal portions, namely, a forward portion, a flap portion and a rearward portion, such that said rearward portion and said flap portion are exposed.

25        11. A wrapping structure for a sanitary napkin as in clause 9, in which said flaps are positionally offset longitudinally forwardly of said napkin body.

30        12. A wrapping structure for a sanitary napkin as in clause 9, in which said peelable layer comprises a peelable tape attached to said wrapping material.

13. A wrapped sanitary napkin comprising a sanitary napkin individually wrapped within wrapping material, the

sanitary napkin being folded at least once so that the outer surface of the folded sanitary napkin is constituted by at least part of that surface of the sanitary napkin which is intended not to contact the user's skin, the outer surface of the folded sanitary napkin carrying at least one adhesive area, the inner surface of the wrapping material carrying at least one peelable layer at a position which is opposed to the or each adhesive area.

14. A sanitary napkin as in clause 13 which comprises an elongate main body and two fastening flaps adapted to extend outwardly from respective opposed side edges of the main body, one surface of each fastening flap carrying at least one adhesive area, the fastening flaps being folded to overlies the main body with their adhesive areas being releasably adhered to a peelable layer provided on that surface of the main body which is intended not to contact the user's body.

15. A sanitary napkin as in clause 14 in which the peelable layer on the main body comprises adhesive whose adhesion to the associated adhesive areas on the flaps is weaker than that to the main body.

#### BRIEF DESCRIPTION OF THE DRAWINGS

Fig. 1 is a perspective view showing the first embodiment of a wrapping structure for a sanitary napkin of the present invention (first invention);

Fig. 2 is a bottom view of the sanitary napkin in the wrapping structure shown in Fig. 1;

Fig. 3 is a bottom view of a wrapping material in the wrapping structure shown in Fig. 1;

Fig. 4 is a schematic perspective view showing one form during the process for folding the sanitary napkin in three;

Fig. 5 is a schematic perspective view showing an important part of a wrapping procedure for wrapping the sanitary napkin, which is folded in three, with the wrapping material;

Fig. 6 is a schematic perspective view showing an important portion of a wrapping procedure for continuously wrapping sanitary napkins, which are each folded into three, with a wrapping material;

Fig. 7 is a perspective view showing the second embodiment of a wrapping structure of a sanitary napkin

of the first invention;

Fig. 8 is a bottom view of the sanitary napkin in the wrapping structure shown in Fig. 7;

Fig. 9 is a perspective view showing a third embodiment of a wrapping structure of a sanitary napkin of the first invention;

Fig. 10 is a bottom view of the sanitary napkin in the wrapping structure shown in Fig. 9;

Fig. 11 is a perspective of a fourth embodiment of a wrapping structure of a sanitary napkin of the first invention;

Fig. 12 is a bottom view of the sanitary napkin in the wrapping structure shown in Fig. 11;

Fig. 13 is a perspective view showing a fifth embodiment of a wrapping structure of a sanitary napkin of the first invention;

Fig. 14 is a bottom view of the sanitary napkin in the wrapping structure shown in Fig. 13;

Fig. 15 is a perspective view showing a sixth embodiment of a wrapping structure of a sanitary napkin of the first invention;

Fig. 16 is a bottom view of the wrapping material in the wrapping structure shown in Fig. 15;

Fig. 17 is a perspective view showing a seventh embodiment of a wrapping structure of a sanitary napkin

of the first invention;

Fig. 18 is a bottom view of another example of a wrapping material which can be used in the wrapping structure of the first invention;

Fig. 19 is an enlarged sectional view of an I portion of the wrapping material shown in Fig. 18;

Fig. 20 is a perspective view showing the first embodiment of a wrapping structure of a sanitary napkin of the present invention (second invention);

Fig. 21 is a bottom view of the sanitary napkin in the wrapping structure shown in Fig. 20;

Fig. 22 is a schematic bottom view showing the sanitary napkin of Fig. 21 but with the flaps folded;

Fig. 23 is a bottom view of a wrapping material in the wrapping structure shown in Fig. 20;

Fig. 24 is a schematic perspective view showing one form during the process for folding the sanitary napkin into three;

Fig. 25 is a schematic perspective view showing an important portion of a wrapping procedure for wrapping the sanitary napkin, which is folded into three, with the wrapping material.

Fig. 26 is a schematic perspective view showing an important portion of a wrapping procedure for continuously wrapping sanitary napkins, which are each folded

into three, with a wrapping material;

Fig. 27 is a perspective view showing one embodiment of a wrapping structure of the present invention;

Fig. 28 is a bottom view of a sanitary napkin in the wrapping structure shown in Fig. 27;

Fig. 29 is a bottom view of a wrapping material in the wrapping structure shown in Fig. 27;

Fig. 30 is a schematic perspective view showing one form of the process for folding the sanitary napkin into three;

Fig. 31 is a schematic perspective view showing a wrapping procedure for wrapping the sanitary napkin, which is folded into three, with the wrapping material;

Fig. 32 is a schematic perspective view showing an important portion of a wrapping procedure for continuously wrapping sanitary napkins, which are each folded into three, with a wrapping material;

Fig. 33A is a perspective view showing another embodiment of a wrapping structure of a sanitary napkin of the present invention, and Fig. 33B is a sectional view taken on line I-I of Fig. 33A; and

Fig. 34A is a bottom view of the sanitary napkin taken out by opening up the wrapping structure of Fig. 33A, and Fig. 34B is a perspective view showing the sanitary napkin of Fig. 34A but with the flap portions



peeled off in directions as shown by arrows B, respectively.

#### DETAILED DESCRIPTION OF THE EMBODIMENT

Embodiments of the present invention will be described in detail with reference to the accompanying drawings. It should be understood, however, the present invention is <sup>not</sup> limited to these embodiments.

Fig. 1 is a perspective view showing the first embodiment of a wrapping structure of a sanitary napkin of the present invention (first invention), Fig. 2 is a bottom view of the sanitary napkin in a wrapping structure shown in Fig. 1, and Fig. 3 is a bottom view of a wrapping material in the wrapping structure shown in Fig. 1. Fig. 4 is a schematic perspective view showing one form of the process for folding the sanitary napkin into three, Fig. 5 is a schematic perspective view showing a wrapping procedure for wrapping the sanitary napkin, which is folded into three, with the wrapping material, and Fig. 6 is a schematic perspective view showing an important part of a wrapping procedure for continuously wrapping sanitary napkins, which are each folded into three, with a wrapping material.

As shown in Fig. 1, in a wrapping structure 1 of the sanitary napkin in the first embodiment, the sani-

tary napkin is folded back such that its non-contacting surface (the surface not contacting the user's skin) is exposed (comes to be an external side) and individually wrapped with the wrapping material. Specifically, the sanitary napkin 10 is folded into three along two folding portions 17 which divide the longitudinal direction of the sanitary napkin 10 generally into three equal parts; a forward portion 13, a central portion 14 and a rearward portion 15, in order of the forward portion 13, the central portion 14 and the rearward portion 15 and individually wrapped with the wrapping material 20. The sanitary napkin 10 to be wrapped with the wrapping structure of the present invention is a normal sanitary napkin including a contacting surface (the surface contacting the user's skin) 11 formed of a liquid permeable sheet material, a non-contacting surface 12 formed of a liquid impermeable sheet material, and a liquid retaining absorber interposed between the contacting surface 11 and the non-contacting surface 12.

As shown in Fig. 2, the forward portion 13 and the central portion 14 of the sanitary napkin 10 are provided with adhesive layers 16, respectively. As shown in Fig. 3, a peelable layer 21 is provided on that part of an inner area of the surface of the wrapping materi-

al 20 which corresponds to the adhesive layer 16.

Each marginal side portion 22 of the wrapping material 20 is connected by heat sealing, and perforations 24 for facilitating the opening of the wrapping material are provided at a central surface portion along one marginal end portion 23.

As examples of the wrapping material 20, there can be listed film or non-woven fabric which is composed of polypropylene, low density polyethylene, ethylene-propylene copolymer, a mixture of polyethylene and polypropylene, polyvinyl alcohol, or the like, paper, composite material of them, and the like, which are 5 to 50  $\mu\text{m}$  in thickness.

Here, the forward portion 13 is in a front surface direction of the user when the sanitary napkin is in use. A provision of the peelable layer 21 is required to at least a corresponding part to each of the adhesive layers. The peelable layer 21 may be disposed at other part than the corresponding part.

The characteristic parts in the wrapping structure 1 for the sanitary napkin according to the first embodiment will be described in more detail.

As shown in Fig. 2, the adhesive layers 16 are disposed at two places in each of the non-contacting surfaces of the forward and central portions 13 and 14,

with predetermined intervals.

As shown in Fig. 3, the peelable layer 21 is lay in a rectangular shape on that portion of an inner surface area of the wrapping material 20 corresponding to the adhesive layers 16 such that the marginal side portions 22 and the marginal end portions 23 and 23' for firmly securing the absorber by heat sealing.

As shown in Fig. 1, in the wrapping structure 1 for the sanitary napkin, the adhesive layers 16 are adhered onto the peelable layer 21, and therefore the adhesive layer 16 is protected by the peelable layer 21.

The adhesive layers 16 are formed by applying adhesive agent onto the non-contacting surface 12 or otherwise transferring the adhesive layers 16 onto the non-contacting surface 12 after the same has been applied to the wrapping material 20 which was subjected to the peel treatment. As the adhesive agent forming the adhesive layers, there is used one holding a two-phase block structure of a styrene phase and a rubber phase, chiefly composed of, for example, styrene series block polymer, tackifier, and softener. Examples of the styrene series block polymer may include styrene-ethylene-butylene-styrene block copolymer (SEBS), style-isoprene-styrene block copolymer (SIS), styrene-

butadiene-styrene block copolymer (SBS), styrene-ethylene-propylene-styrene copolymer (SEPS), and the like. These styrene series block polymers are block copolymers in which the molecular weight of the styrene portion and the rubber portion are preferably 7000 to 20000 and 35000 to 70000, respectively.

As examples of the tackifier, there can be listed C<sub>5</sub> series petroleum resin, C<sub>9</sub> series petroleum resin, C<sub>5</sub>/C<sub>9</sub> series petroleum resin, polyterpene resin-as copolymer of  $\alpha$  pinene,  $\beta$  pinene and dipentene, rosin series resin, hydrogenation-based additive of them, and the like, whose softening point is 80°C or more and whose molecular weight is 400 to 2000.

As examples of the softener, there can be listed process oil, various kinds of plasticizer, polybutene, liquid resin, and the like whose softening point is 10°C or less and whose average molecular weight is 200 to 700.

The tackifier preferably has the following composition A or B.

A.	Styrene series block polymer	100 weight parts
	Tackifier resin	150 to 200 weight parts
	Softener	30 to 100 weight parts
B.	Styrene series block polymer	100 weight parts
	Tackifier resin	200 to 500 weight parts

Softener

100 to 400 weight parts

The peelable layer 21 is formed by applying a peel treatment agent onto an inner surface of the wrapping material 20 or adhering a peelable tape thereto, or the like. The composition of the peel treatment agent or peeling material of the peelable tape is preferably selected from silicon resin series, fluororesin series, octadecylisocyanate series, and the like. Particularly, as the composition of the peeling agent, it is preferable to apply the silicon resin series and dry with the heat, or spray the same onto the inner surface of the wrapping material 20 in order to form a thin film thereon.

It is preferable to use polyolefine or polyester film as the peelable tape. This peelable tape, i.e., polyolefine or polyester film, is preferably attached to the wrapping material by heating, ultrasonic wave, or the like. Thus obtained peelable tape has a suitable degree of rigidity. Moreover, since this peelable tape is easy to open and excellent in thermal resistance, it is advantageous in view of production.

The 180° peel strength of the adhesive layer and the peelable layer is preferably 30 to 90 g/50 mm. If the 180° peel strength is smaller than 30 g/50 mm, the wrapping material is peeled off to permit the napkin to

move in the wrapping bag and to permit the adhesive agent to adhere to the surface where the peel treatment is not applied. On the other hand, if the 180° peel strength exceeds 90 g/50 mm, there are encountered such shortcomings, among others, that it becomes difficult to peel off the wrapping material and the peeling sound becomes too noisy.

The tucking strength of the adhesive layer is preferably 250 g or more. If the tucking strength is less than 250 g, the adhering strength is likely to be changed with the passage of time, which causes slippage of the sanitary napkin or leakage of discharged material during use. The adhesive layer is preferably has such degree of cohesive strength enough to prohibit the adhesive material from migrating to a cotton test cloth.

The 180° peel strength was measured in the following manner, using a sanitary napkin with an adhesive agent applied thereto and a wrapping material provided with a peelable means contacting the sanitary napkin, as test samples. The tucking strength and the cohesive strength were also measured by the following manner.

<The 180° peel strength (adhering strength)>

An adhesive agent was applied onto a sheet of

polyethylene terephthalate film 50  $\mu$ m in thickness, and the same was pressure attached to a stainless plate (sus302) by a single reciprocating movement (back and forth) of a rubber roller of 2 kg. The 180° peel strength at this time was measured.

<Tucking strength (BOX adhering strength test)>

A sanitary napkin with an adhesive agent applied thereto and a piece of test cloth (cotton shirting No. 3) cut into 80 x 200 mm were left as they were for more than two hours at a temperature of 30 to 31°C and the resultant was used as test samples.

Then, the test cloth was fixed onto a glass plate, the sanitary napkin was attached to it, a load of 750 g was applied to its entire surface, and then left as it is for one minute in that condition. Thereafter, the load was changed from 750 g to 225 g, and a sliding load was applied to one end of the sanitary napkin and the load for sliding the sanitary napkin in one minute was measured.

<Cohesive strength>

A sanitary napkin with an adhesive agent applied thereto and a piece of test cloth (cotton shirting No. 3) cut into 80 x 200 mm were attached to each other, then subjected to a load of 1 kg and left as they were for 24 hours at a constant temperature of 40°C and at a



constant moisture of 80%. Thereafter, the test cloth was peeled off and it was confirmed that the adhesive material is not migrated to the test cloth at that time.

In the first embodiment, the adhesive layers are disposed at two places on the forward portion and two places at the rearward portion respectively, but the present invention is not limited to this embodiment. For example, the number of the places where the adhesive layers are to be disposed, as well as the shape thereof, is not particularly limited. It may be one place, or three or more places. The peelable layer is not limited to the above embodiment, either. For example, it may be provided on only that portion which corresponds to the adhesive layers.

For using the sanitary napkin, the perforations 24 shown in Fig. 1 are pulled to open the wrapping material 20 and the peelable layer 21 of the wrapping material 20 is peeled off the adhesive layers 16 of the sanitary napkin 10. By doing this, the sanitary napkin is brought into a condition readily usable.

Next, a method for forming the wrapping structure 1 for a sanitary napkin according to the first embodiment will be described.

First, the sanitary napkin 10 of Fig. 2 is folded

back into three toward the contacting portion 11 side at the central portion 14 along the folding lines 17 in order of the rearward portion 15 and the forward portion 13 such that the forward portion 13 comes outside as shown in Fig. 4. Then, as shown in Fig. 4, the sanitary napkin 10, which is folded into three, is placed on the wrapping material, and the respective marginal end portions 23 and 23' are folded in directions as shown by arrows A so that the marginal-end portion 23 comes top. After the sanitary napkin 10 is wrapped with the wrapping material in the manner as just mentioned, the respective marginal side portions 22 are heat sealed. By doing this, the wrapping structure 1 for a sanitary napkin can be formed. As shown in Fig. 6, industrially, the sanitary napkins 10, which are each folded into three, are normally continuously placed on the respective peelable layers 21 of a continuous sheet of the wrapping material 20 on which the peelable layers 21 are disposed at predetermined spaces, and the sanitary napkins 10 are continuously wrapped with the wrapping material 20 from opposite sides. Thereafter, the wrapping material 20 is cut along the cutting lines 25 and heat sealed at the same time. In this way, the wrapping structures for a sanitary napkin according to the present invention (the

first invention) are formed continuously.

The second embodiment of the first invention will now be described with reference to Figs. 7 and 8. Those parts which are not particularly described in detail are the same as the first embodiment.

Here, Fig. 7 is a perspective view showing the first embodiment of a wrapping structure for a sanitary napkin according to the first invention, and Fig. 8 is a bottom view of a sanitary napkin in the wrapping structure of Fig. 7.

In a wrapping structure 1a of a sanitary napkin according to the second embodiment of the first invention shown in Fig. 7, adhesive layers 16a are disposed in the opening direction of the wrapping structure. Each adhesive layer 16a is formed in a bead shape. A plurality of such adhesive layers 16a are disposed in parallel relation in the opening direction (perpendicular direction relative to the longitudinal direction of the wrapping material 20a) of the wrapping structure 1a.

As shown in Fig. 8, in the sanitary napkin 10a, a plurality of adhesive layers 16a are disposed at the forward portion 13a of the sanitary napkin 10a in vertical rows in a direction perpendicular to the longitudinal direction of the sanitary napkin. Each

row has a bead-like configuration. By placing the sanitary napkin 10a, which is folded back into three, on the wrapping material 20a, such that the longitudinal direction of the adhesive layer 16a is parallel to the longitudinal direction of the wrapping material 20a, the adhesive layers 16a are disposed in the opening direction of the wrapping structure 1a as mentioned above.

The adhesive layers 16a can be formed by known spraying method such as a so-called beading method, a spiral spraying method, or the like. Through these methods, the adhesive layers can be formed in a bead (linear) shape, a dot shape, a spiral shape, a corrugated shape, or the like. The widths of the line and the dot in the shapes of the adhesive layers are preferably in a range of from 0.1 to 2 mm. The widths deflection of the spiral and corrugated lines are preferably in a range of from 1 to 10 mm.

Furthermore, in the above-mentioned spraying method, by providing a plurality of nozzles for injecting adhesive agents side by side, a plurality of adhesive layers having the above mentioned shapes can be disposed in parallel relation.

Next, the third embodiment of the first invention is shown in Figs. 9 and 10. Those parts which are not

particularly described in detail are the same as the above-mentioned first embodiment.

Fig. 9 is a perspective view showing the third embodiment of a wrapping structure for a sanitary napkin according to the first invention, and Fig. 10 is a bottom view of a sanitary napkin in the wrapping structure of Fig. 9.

In the wrapping structure 1A for a sanitary napkin according to the third embodiment shown in Fig. 9, the adhesive layer 16A is formed in bead shape, and a plurality of such adhesive layers 16A are disposed in parallel relation (vertical rows) in the opening direction of the wrapping structure.

As shown in Fig. 10, the above adhesive layers 16A are disposed on the forward portion 13A of the sanitary napkin 10A in parallel relation to the longitudinal direction of the napkin.

Next, the fourth embodiment of the first invention is shown in Figs. 11 and 12. Those parts which are not particularly described are the same as the above-mentioned first embodiment.

Fig. 11 is a perspective view showing the fourth embodiment of a sanitary napkin according to the first invention, and Fig. 12 is a bottom view of the sanitary napkin in the wrapping structure shown in Fig. 11.

Next, the fifth embodiment of the first invention is shown in Figs. 13 and 14. Those parts which are not particularly described are the same as the above-mentioned first embodiment.

Fig. 13 is a perspective view showing the fifth embodiment of a wrapping structure for a sanitary napkin according to the first invention, and Fig. 14 is a bottom view of a sanitary napkin in the wrapping structure shown in Fig. 13.

In the wrapping structure 1C for a sanitary napkin according to the fifth embodiment shown in Fig. 13, the adhesive layer 16C is formed in spiral shape, and a plurality of such adhesive layers 16C are disposed in parallel relation in the opening direction of the wrapping structure.

As shown in Fig. 14, the above adhesive layers 16C are disposed on the forward portion 13C of the sanitary napkin 10C in parallel relation to the longitudinal direction of the napkin.

Next, the sixth embodiment of the first invention is shown in Figs. 15 and 16. Those parts which are not particularly described are the same as the above-mentioned first embodiment.

Fig. 15 is a perspective view showing the sixth embodiment of a wrapping structure for a sanitary

napkin according to the first invention, and Fig. 16 is a bottom view of a wrapping material in the wrapping structure shown in Fig. 15.

In the wrapping structure 1D for a sanitary napkin according to the sixth embodiment shown in Fig. 15, a wrapping material 20D is formed of a peelable sheet which is provided at its entire inner surface area with a peelable layer, and respective sides of the wrapping material 20D are sealed by an adhesive agent.

Here, the wrapping material 20D is formed of the same material as the first embodiment, and is a sheet whose entire inner surface area is subjected to peel treatment as in the case with the peel treatment which is previously described in detail with reference to the first embodiment.

As shown in Fig. 16, an adhesive agent is applied to each marginal side portion 22D of the wrapping material 20D. Owing to this arrangement, the wrapping material 20D is formed in a bag shape by sealing the respective marginal side portions 22D. The adhesive agent is preferably higher in adhesive strength than the adhesive agent which is used in the above-mentioned adhesive layers and desirably remained on the wrapping material after opening. Examples are those adhesive agents selected from rubber series such as natural

rubber, butadiene rubber and the like, acrylic series, urethane series, silicon series, and the like.

The peelable sheet of the type mentioned above is generally difficult to be sealed by heating. However, it can be sealed by heat having a higher melting point than that of the peeling agent. Depending on the thickness of the layer formed by peel treatment, it can also be sealed by using, for example, a heat roll. As for the sealing, the peelable sheet is preferably sealed by an adhesive agent as in this embodiment, or sealed by means of mechanical pressure as in the first embodiment.

Next, the seventh embodiment of the first invention is shown in Fig. 17. Those parts which are not particularly described are the same as the above-mentioned first embodiment.

Fig. 17 is a perspective view showing the seventh embodiment of a sanitary napkin and a wrapping structure according to the first invention.

In the seventh embodiment shown in Fig. 17, the wrapping material 20E is formed in a bag shape by sealing the respective marginal side portions 22E by mechanical pressure.

Also in the first invention, a wrapping material having a structure shown in Figs. 18 and 19 can be



used.

Here, Fig. 18 is a bottom view showing another example of a wrapping material which can be used in the first embodiment, and Fig. 19 is an enlarged perspective view of that portion indicated by I of the wrapping material shown in Fig. 18.

At least that part of the inner surface area of the wrapping material 20F of Fig. 18 where the peelable layer 21F is provided, includes irregular portions 24F.

The irregular portions 24F are rectangular, circular, linear, or the like in configuration whose size is preferably recognizable by sight and feel. Specifically, in the case where the irregular portions are, for example, circular in configuration, it is preferable that the size of the projecting portions is in a range of from 0.5 to 5 mm in diameter, and the height thereof is in a range of from 0.5 to 2 mm. By virtue of a provision of the irregular portions 24G, an area of contact between the wrapping material and the adhesive portion is reduced, which facilitates an easy peeling-off. Also, the wrapping material can be increased in strength. Furthermore, if only the contacting area of the irregular portion relative to the adhesive portion of the irregular portion is subjected to peel treatment, economic efficiency is in-

creased and thus advantageous in view of production.

The irregular portions 24F can easily be formed by using a method and apparatus good for performing a normal embossing.

As shown in Fig. 19, in the above wrapping material, the irregular portion 24F is provided on a surface thereof with a very small irregular portion 25F smaller than the above-mentioned irregular portion 24F. The very small irregular portions 25F are rectangular, circular, linear, or the like in configuration whose size is preferably recognizable by sight and feel. Specifically, in the case where the very small irregular portions are, for example, circular in configuration, it is preferable that the size of the projecting portions is in a range of from 10 to 500  $\mu\text{m}$  in diameter, and the height thereof is in a range of from 10 to 50  $\mu\text{m}$ . By virtue of a provision of the very small irregular portions 25G, the peelability of the wrapping material 20F can further be enhanced.

The very small irregular portion can be formed by the same method and apparatus as in the case with the above-mentioned irregular portion. As for the sequential order for forming the irregular portion and the very small irregular portion, the irregular portion may be formed after the very small irregular portion is

beforehand formed on the wrapping material, or both the irregular portion and the very small irregular portions may be formed at the same time.

The very small irregular portion is usually disposed on an entire surface of the irregular portion, but it may be disposed on the surface of only the projecting portion of the above-mentioned irregular portion.

Next, the first embodiment of the second invention will be described with reference to Figs. 20 to 26. Those parts which are not particularly described in detail are the same as the above-mentioned first embodiment of the first invention.

Fig. 20 is a perspective view showing the first embodiment of a wrapping structure for a sanitary napkin according to the present invention (the second invention), Fig. 21 is a bottom view of a sanitary napkin in the wrapping structure shown in Fig. 20, Fig. 22 is a schematic bottom view showing the sanitary napkin of Fig. 21 but with the flaps folded, and Fig. 23 is a bottom view of a wrapping material in the wrapping structure shown in Fig. 20. Fig. 24 is a schematic perspective view showing one form during the process for folding the sanitary napkin into three, Fig. 25 is a schematic perspective view showing an

important portion of a wrapping procedure for wrapping the sanitary napkin, which is folded into three, with the wrapping material, and Fig. 26 is a schematic perspective view showing an important portion of a wrapping procedure for continuously wrapping sanitary napkins, which are each folded into three, with a wrapping material.

In a wrapping structure 101 of a sanitary napkin in this embodiment shown in Fig. 20, a sanitary napkin having a pair of flaps extending outwardly in the width direction from longitudinal opposite marginal side portions of the napkin body is folded back such that a non-contacting surface of the napkin body is exposed (coming to be outside) and individually wrapped with the wrapping material. Specifically, a sanitary napkin 110 having a pair of flaps 121 extending outwardly in the width direction from elongated opposite marginal sides of the napkin body 111 is folded into three in order of a rearward portion 116 and a forward portion 114 along two folding portions 119 for generally equally dividing the longitudinal direction of the sanitary napkin 110 into three of a forward portion 114, a central portion 115 and the rearward portion 116, wherein the sanitary napkin 110 is folded into three toward the contacting surface 112 of the central

portion 115 in order of the rearward portion 116 and the forward portion 114, and individually wrapped with a wrapping material 130.

In the sanitary napkin 110 which is wrapped with the wrapping structure of the present invention (the second invention), the contacting surface 112 is formed of a liquid permeable sheet material according to the wrapping structure of the present invention (the second invention), while the non-contacting surface 113 and the flap 121 are formed from a liquid impermeable sheet material. Furthermore, this sanitary napkin 110 is a normal napkin including a liquid-holding absorber between the contacting surface 112 and the non-contacting surface 113, and a pair of flaps 121 extending outwardly in the width direction from longitudinal opposite marginal side portions of the napkin body.

As shown in Fig. 21, the pair of flaps 121 are provided at non-contacting surfaces 113 thereof with first adhesive layers 122 respectively, while the sanitary napkin 110 is provided on the non-contacting surface 113 of the central portion 115 with a peelable layer 117. As shown in Fig. 22, the pair of flaps 121 are folded toward the non-contacting surface 113 of the napkin body 111, and the first adhesive layers 122 and the first peelable layer 117 are detachably attached to

each other.

Furthermore, as shown in Fig. 21, the sanitary napkin 110 is provided on the non-contacting surface 113 of the forward portion 114 with a second adhesive layer 118, and as shown in Fig. 23, the wrapping material 130 is provided at that portion of an inner surface area thereof corresponding to the second adhesive layer 118 with a second peelable layer 131. The second adhesive layer 118 and the second peelable layer 131 are detachably attached to each other.

Here, the rearward portion 116 refers to that part of the sanitary napkin which is positioned in a rear surface direction of the user when the sanitary napkin is in use. A provision of the second peelable layer 131 is required to at least a corresponding part of the sanitary napkin to the second adhesive layer 118. The peelable layer 131 may be disposed at other part than the corresponding part.

The characteristic parts in the wrapping structure 101 for a sanitary napkin according to this embodiment will be described in more detailed.

As shown in Fig. 21, the first adhesive layers 122 are disposed at generally central portions of the flaps 121 on their non-contacting surfaces side, respectively, each having a dimension large enough to secure a

central portion of the sanitary napkin to the shorts. The first peelable layer 117 is disposed in a rectangular shape on the non-contacting surface 113 of the central portion 115 of the sanitary napkin 110 in such a manner as to cover a generally entire surface of the central portion 115. As shown in Figs. 23 and 25, the second peelable layer is disposed in a rectangular shape over a generally entire surface of an inner surface area of the wrapping material 130.

As shown in Fig. 22, the flaps 121 are folded toward the non-contacting surface 113 side of the napkin body 111 so that the first adhesive layers 122 and the first peelable layer 117 are in contact with each other. Owing to this arrangement, the first adhesive layers 122 and the first peelable layer 117 are detachably attached to each other, and the first adhesive layers 122 are protected.

As shown in Fig. 21, the second adhesive layer 118 is formed in a rectangular shape on the non-contacting surface 113 of the forward portion 114, i.e., on the surface adhered to the shorts when the sanitary napkin is in use. As shown in Fig. 23, the second peelable layer 131 is disposed at that part of the inner surface area of the wrapping material 130 which corresponds to the second adhesive layer 118, in such a manner as to

form the opposite marginal side portions 132 and the marginal end portions 133 and 133' which are heat sealed to firmly attach the opposite marginal sides of the wrapping material by heat sealing.

As shown in Fig. 20, in the wrapping structure 101 for a sanitary napkin, the second adhesive layer 118 is detachably attached to the second peelable layer 131. Owing to this arrangement, the second adhesive layer 118 is protected.

In this embodiment, the first adhesive layer and the second adhesive layer are formed at one places respectively. However, the present invention is not limited to this. For example, the number of the adhesive layers and the shape thereof are not particularly limited, and they may be formed on a plurality of places respectively. The first peelable layer and the second peelable layer are not limited to the above-mentioned embodiment, either. For example, they may be formed on only those parts which correspond to the first adhesive layer and the second adhesive layer, respectively. Furthermore, the flaps may be formed in such a manner as to be positionally offset toward the longitudinally forward direction of the napkin body.

For using the sanitary napkin, the perforations 134 shown in Fig. 20 are pulled to open the wrapping



material 130, the second peelable layer 131 is peeled off the second adhesive layer 116, and the first peelable layer 117 is peeled off the first adhesive layers 122. By doing this, the sanitary napkin is made in a condition ready to use.

Next, the method for forming the wrapping structure 101 for a sanitary napkin of this embodiment will be described.

First, the flaps 121 of the sanitary napkin 121 shown in Fig. 21 are folded toward the non-contacting surface 113 side of the napkin body 111 to attach the first adhesive layers 122 and the first peelable layer 117 to each other as shown in Fig. 22. Then, the sanitary napkin 110 is folded back into three toward the contacting surface 112 side of the central portion 115 along the folding lines 119 in order of the rearward portion 116 and the forward portion 114 such that the forward portion 114 comes outside as shown in Fig. 24. Then, as shown in Fig. 25, the sanitary napkin 110, which is folded into three, is placed on the wrapping material 130, and the respective marginal end portions 133 and 33' are folded in directions as shown by arrows A so that the marginal end portion 133 comes top. After the sanitary napkin 110 is wrapped with the wrapping material 130 in the manner as just men-

tioned, the respective marginal side portions 132 are heat sealed. By doing this, the wrapping structure 101 for a sanitary napkin can be formed. As shown in Fig. 26, industrially, the sanitary napkins 110, which are each folded into three, are normally continuously placed on the respective peelable layers 131 of a continuous sheet of the wrapping material 130 on which the peelable layers 131 are disposed at predetermined spaces, and the sanitary napkins 110 are continuously wrapped with the wrapping material 130 from opposite sides. Thereafter, the wrapping material 130 is cut along the cutting lines 135 and heat sealed at the same time. In this way, the wrapping structures for a sanitary napkin according to the present invention (the second invention) are formed continuously.

The modes or forms described in detail in the embodiments of the first invention, that is, the forms or procedures of the second to seventh embodiment and the wrapping material are applicable to the second invention.

Next, the embodiments of the third invention will be described with reference to Figs. 27 to 32. Those parts which are not particularly described in detail are the same as the first embodiment according to the first invention.

Fig. 27A is a perspective view showing one embodiment of a wrapping structure for a sanitary napkin according to the present invention (third invention), Fig. 27B is a sectional view taken on line I-I of the wrapping structure shown in Fig. 27A, and Fig. 28 is a schematic view showing an opening state of the wrapping structure of Fig. 27A. Fig. 29 is a bottom view of the sanitary napkin shown in Fig. 27, Fig. 30 is a schematic perspective view showing one form of a procedure for forming the sanitary napkin into three, Fig. 31 is a schematic perspective view showing a wrapping state of the sanitary napkin, which is folded into three, with the wrapping material, and Fig. 32 is a schematic perspective view showing an important portion of a procedure for continuously wrapping the sanitary napkin, which is folded into three, with the wrapping material.

The wrapping structure 201 for a sanitary napkin according to this embodiment shown in Fig. 27 comprises a sanitary napkin 210 and a wrapping material 220 for wrapping the same. The sanitary napkin 210 is folded back along the folding portions 217, and an adhesive layer 216 is interposed between an exposed non-contacting surface 212 and an inner surface of the wrapping material 220. The adhesive layer 216 is

formed of an adhesive agent which is separated in layer to form an adhesive portions 216A and 216B on the non-contacting surface 212 and the inner surface of the wrapping material 220 (see Fig. 28) when the wrapping structure 201 is opened.

More specifically, in the wrapping structure 201 of a sanitary napkin according to this embodiment, the sanitary napkin 210 is folded into three along two folding portions 217 which divide the longitudinal direction of the sanitary napkin 210 generally into three equal parts; a forward portion 213, a central portion 214 and a rearward portion 215, in order of the forward portion 213, the central portion 214 and the rearward portion 215, and individually wrapped with the wrapping material 220. The sanitary napkin 210 to be wrapped with the wrapping structure of the present invention is a normal sanitary napkin including a contacting surface 211 formed of a liquid permeable sheet material, a non-contacting surface 212 formed of a liquid impermeable sheet material, and a liquid retaining absorber interposed between the contacting surface 211 and the non-contacting surface 212.

Here, the forward portion 213 is a part which is located in a forward direction of the user when the sanitary napkin is in use.

As examples of the wrapping material 220, polypropylene, low density polyethylene, polyvinyl alcohol, non-woven fabric, paper, composite material of them which are 5 to 50  $\mu\text{m}$  in thickness are preferably used. It is preferable that for wrapping, the wrapping material 220 is sealed in the same direction as the longitudinal direction of the sanitary napkin.

The characteristic parts in the wrapping structure 201 for a sanitary napkin according to this embodiment will be described in more detailed.

As shown in Fig. 27B, the adhesive layer 216 comprises adhesive portions 216A and 216B, and is disposed between the non-contacting surface 212 of the sanitary napkin and the inner surface of the wrapping material 220. As shown in Fig. 28, the adhesive portion 216 is separated in layer to form the adhesive portions 216A and 216B respectively on the non-contacting surface 212 of the sanitary napkin and the inner surface of the wrapping material 220 when the wrapping structure 201 is opened.

This adhesive layer can be formed by using two kinds of adhesive agents having different adhesive strengths and physical properties, in which the adhesive strength between the adhesive portions 216A and 216B becomes weaker than the adhesive strength between

the non-contacting surface 212 of the sanitary napkin and the adhesive portion 216A and the adhesive strength between the inner surface of the wrapping material 220 and the adhesive portion 216B. Specifically, in this embodiment, the adhesive portion 216A is formed of an adhesive agent which has a strong adhesive strength and the other adhesive portion 216B is formed of an adhesive agent which has a weak adhesive strength. The adhesive layer 216 is formed by superimposing the adhesive portions 216A and 216B one upon the other.

As particularly preferable examples of the two kinds of adhesive agent, there can be listed, as the adhesive agent having a strong adhesive strength, pressure-sensitive adhesive agent chiefly composed of natural rubber or synthetic rubber such as butadien, or the like, and there can also be listed, as the adhesive agent having a weak adhesive strength, pressure-sensitive adhesive agent chiefly composed of acrylic ester, or the like. In the case where the same kind of adhesive agents are used, they can be used in different composition. At that time, a difference in adhesive strength is desirably in a range of from 0.1 to 5 kg/25 mm, and more desirably in a range of from 0.5 to 3 kg/25 mm.

The above adhesive strength was obtained by apply-

ing an adhesive agent onto a polyethylene terephthalate film 50  $\mu\text{m}$  in thickness, then attaching the same to a stainless plate (sus304) by a single reciprocating movement (back and forth) of a rubber roller of 2 kg, and measuring 180° peel strength by pulling one end of the film at a speed of 300 mm/min by a TENSILON tensile testing machine.

By forming the adhesive layer using the above adhesive agent, the adhesive portions 216A and 216B are not attached to each other too firmly when they are superimposed one upon the other, and the adhesive portions 216A and 216B can easily be peeled off. Therefore, the adhesive portion (adhesive portion 216A), which is used when the sanitary napkin is used, can be protected without a provision of a peelable sheet or the like.

The above adhesive layer 216 can be formed by any of the above-mentioned two types of spraying methods or by a method for transferring the adhesive agent after the adhesive agent is sprayed onto the non-contacting surface 212.

Even if the same kind of adhesive agents are applied to both the adhesive portions 216A and 216B, the above type of adhesive portion which is readily separated in layer by providing a peelable sheet, whose

surface facing the adhesive portion 216A is subjected to peel treatment, between the both adhesive portions. The peeling strength of the adhesive portion 216A and the peelable sheet is preferably in a range of from 10 to 200 g/50 mm, and more preferably in a range of from 30 to 90 g/50 mm. This peeling strength was measured in the same manner when the above adhesive strength was measured.

In this embodiment, the adhesive layer is formed at one place in the forward portion and one place in the rearward portion. However, the present invention is not limited to this. For example, the number of the adhesive layers and the shape thereof are not particularly limited, and the adhesive layer may be formed on two or more places. The adhesive layer may be of three or more lamination structure instead of two.

For using the sanitary napkin, the perforations 223 shown in Fig. 27 are pulled to open the wrapping material 220, and the adhesive portion 216A and the other adhesive portion 216B are peeled off. By doing this, the sanitary napkin is made in a condition ready to use.

Next, a method for forming the wrapping structure 201 for a sanitary napkin according to this embodiment



will be described.

First, the sanitary napkin 210 provided with the adhesive layers 216 each formed on the forward portion 213 and the central portion 214 on the non-contacting surface shown in Fig. 29 is folded back into three toward the contacting surface 211 side of the central portion 214 along the folding lines 117 in order of the rearward portion 215 and the forward portion 213 such that the forward portion 213 comes outside as shown in Fig. 30. Then, as shown in Fig. 31, the sanitary napkin 210, which is folded into three, is placed on the wrapping material, and the respective marginal end portions 223 and 223' are folded in directions as shown by arrows A so that the marginal end portion 223 comes top. After the sanitary napkin 110 is wrapped with the wrapping material in the manner as just mentioned, the respective marginal side portions 222 are heat sealed. By doing this, the wrapping structure 201 for a sanitary napkin can be formed. As shown in Fig. 32, industrially, the sanitary napkins 210, which are each folded into three, are normally continuously placed on a continuous sheet of the wrapping material 220 at predetermined spaces, and the sanitary napkins are continuously wrapped with the wrapping material 220 from opposite sides. Thereafter, the wrapping materi-

al 220 is cut along the cutting lines 224 and heat sealed at the same time. In this way, the wrapping structures for a sanitary napkin according to the present invention (the third invention) are formed continuously.

Another embodiment of the present invention (the third invention) will now be described.

Fig. 33A is a perspective view showing one embodiment of a wrapping structure for a sanitary napkin according to the present invention, Fig. 33B is a sectional view taken on line I-I thereof. Fig. 34A is a bottom view of a sanitary napkin taken out by opening the wrapping structure of Fig. 33A, and Fig. 34B is a perspective view showing the sanitary napkin of Fig. 34A but with the flap portions peeled off in the directions as indicated by arrows B.

In a wrapping structure 230 of a sanitary napkin in this embodiment, the sanitary napkin 240 has a pair of flaps 250 extending outwardly in the width direction from longitudinal opposite marginal side portions of the napkin body 248 [see Figs. 34A and 34B], and as shown in Figs. 33A and 33B, and the adhesive layers 246 and 246' formed of the above-mentioned adhesive agent are disposed between the non-contacting surface 242 of the napkin body 248 exposed as a result of folding back

of the sanitary napkin 240 and the inner surface of the wrapping material 260, and between those parts of the non-contacting surfaces 242 of the napkin body 248 which correspond to the non-contacting surface 242 side of the pair of flaps 250 and the non-contacting surface 242 side of the pair of flaps 250.

For using the napkin, as shown in Fig. 34A, first, the wrapping structure 230 is opened to fold back the sanitary napkin 240 to exposed the napkin body 248, and then the adhesive portion 246A is formed on the non-contacting surface 242 of the exposed napkin body 248, i.e., on the non-contacting surface 242 of the sanitary napkin 240. Then, as shown in Fig. 34B, by peeling off the pair of flaps 250 in the directions as indicated by the arrows B, the adhesive portion 246A' are formed on the non-contacting surfaces 242 side of the pair of flaps 250, and the adhesive portion 246B' are formed on those parts of the non-contacting surface 242 of the napkin body 248 which corresponding to the non-contacting surfaces 242 side of the flaps 250.

Accordingly, since a plurality of adhesive portions are formed on the sanitary napkin, the fixability of the sanitary napkin can be further improved.

This application is divided out of UK Patent Application No. 9325293.0 having a filing date of 10th December 1993.

## CLAIMS

1. A wrapping structure for a sanitary napkin which comprises a sanitary napkin and a wrapping material for  
5 wrapping said sanitary napkin, and in which said sanitary napkin is folded along folding portions, and an adhesive layer is disposed between that exposed area of a surface of said sanitary napkin, which do not contact the user's skin, and an inner area of a surface of said wrapping  
10 material,

wherein said adhesive layer comprises an adhesive agent which is separated in layer, when said wrapping structure is opened, to form adhesive portions each in said non-contacting surface area of said sanitary napkin  
15 and said inner surface area of said wrapping material, respectively.

2. A wrapping structure for a sanitary napkin as claimed in claim 1, in which said sanitary napkin  
20 includes a pair of flaps extending widthwise outwardly from opposite longitudinal marginal side portions of a napkin body, said napkin being folded back after said pair of flaps are folded back toward the contacting or non-contacting surface area side of said napkin body.

25 3. A wrapping structure for a sanitary napkin as claimed in claim 2, in which said pair of flaps are folded back toward said non-contacting surface area side of said napkin body, and adhesive layers each comprising  
30 said adhesive agent are disposed each between the non-contacting surface areas of said pair of flaps and the non-contacting surface area of said napkin body.

4. A wrapping structure for a sanitary napkin as

claimed in any of claims 1 to 3 in which the or each peelable layer on the wrapping material comprises adhesive whose adhesion to the associated adhesive area on the sanitary napkin is weaker than that to the wrapping material.

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Patent  
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Application No: GB 9607987.6  
Claims searched: 1-4

Examiner: William Thomson  
Date of search: 14 June 1996

**Patents Act 1977**  
**Search Report under Section 17**

**Databases searched:**

UK Patent Office collections, including GB, EP, WO & US patent specifications, in:

UK CI (Ed.O): B8C (CWA1, CWP2, CWT2)

Int CI (Ed.6): A61F 13/15, 15/00; B65D 81/00, 85/16

Other: ONLINE:WPI

**Documents considered to be relevant:**

Category	Identity of document and relevant passage	Relevant to claims
	NONE	

X	Document indicating lack of novelty or inventive step	A	Document indicating technological background and/or state of the art.
Y	Document indicating lack of inventive step if combined with one or more other documents of same category.	P	Document published on or after the declared priority date but before the filing date of this invention.
&	Member of the same patent family	E	Patent document published on or after, but with priority date earlier than, the filing date of this application.

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